

NetworkWorld

March 8, 1999 Volume 16, Number 10

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Take the guesswork out of choosing the right VPN solution.

VPN '99 MAXIMIZING COST SAVINGS AND BUSINESS EFFICIENCIES



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Have confidence in the VPN solution you choose.

To make a sound business decision with confidence, you need to have a thorough understanding of the technology, business drivers and issues surrounding the technology you're looking to implement. Only you can determine the needs a VPN will serve in your business. Once those needs have been identified, you must start the process of finding the right VPN solution to meet those needs. The first step in that process is to get advice from the experts.

Network World Technical Seminars has brought together one of the industry's leading VPN experts, Eric Zines of TeleChoice, Inc., and leading VPN solution providers in a comprehensive one-day seminar. The program is designed specifically to help you better understand this technology, the factors you must consider during the decision-making process, and the information you need to choose the right VPN solution for your business. Mr. Zines will explain not just how VPNs work, but how they can be applied to real-world situations. Equally as important is knowing which solution provider can best guide you through the implementation process. This seminar will give you the unique opportunity to discuss your specific needs via live, face-to-face interaction with the industry's leading VPN solution providers.

Benefits of Attending

1. Discover how VPNs can benefit your enterprise
2. Maximize the financial advantages of implementing VPNs
3. Make sense of VPN standards and technologies in use today
4. Explore the application of Quality of Service (QoS) and directory services in delivering mission-critical VPNs
5. Ensure a smooth migration from traditional data services to VPNs
6. Understand and apply Internet security concepts
7. Compare and contrast product and service offerings available for implementing a VPN
8. Gain insight into the network management and administration issues associated with VPNs
9. Explore future directions of VPNs and their effect on your business
10. Meet face-to-face with leading VPN vendors to address your specific needs



Directed by
Eric Zines, TeleChoice, Inc.

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See inside
for complete
details!

Introduction to VPNs

While a majority of IT managers agree that VPNs are a great idea, many will also admit that they don't have a firm grasp on the concepts or technologies. This introductory section will build a foundation for understanding VPNs. The many definitions for "VPN" will be explained, as well as the historical trends and business drivers that have brought us to this point.

- VPNs Defined
- Why VPNs? Why now?
- VPN Benefits

Technology and Relevant Standards

Understanding VPNs requires a background not just in traditional WAN and Internet concepts, but also in a number of other technologies. To fully understand VPNs, and to critically evaluate VPN products and services, IT managers must have a basic understanding of security, IP performance issues, and migration strategies. Explore each of these relevant technologies and important standards efforts.

- The Basics — How VPNs Are Built
 - Do-it-Yourself vs. Fully Managed
 - The VPN Building Blocks
- An Introduction to Internet Security
 - Security Concepts
 - Firewalls
 - IPSec and IKE
 - Digital Certificates
- VPN Performance and Quality of Service
 - QoS Concepts
 - TCP Rate Control
 - Queuing
 - Differentiated Services
 - RSVP
 - MPLS
 - Load Balancing
 - Caching
- Legacy Network Migration and Integration
 - Layer 2 Tunneling
 - L2TP
 - PPTP
 - L2F
 - Solutions for Legacy Migration
- Directory Services
 - Directory Enabled Networks
 - LDAP
- VPN Applications
 - Intranets
 - Extranets
 - Remote Access

The State of the VPN Market

According to a recent VPN market study conducted by TeleChoice and *Network World*, over 35% of IT managers are either implementing a VPN or in the late planning stages. So, what exactly are they implementing? This section will examine the types of VPN products and services available in the market today. We'll explore the VPN provider offerings in depth and focus on the key differences between the various VPN services available today.

- VPN Products
 - Routers
 - Firewalls
 - Tunnel Servers
 - Multi-function Devices
 - Client Software
 - Authentication Products
 - Certificate Authority
- VPN Services
 - Remote Access Services
 - Site-to-Site VPNs
 - Fully Managed Services
 - Network-based VPN Services
 - Extranet Services
 - Secure Hosting
 - Service Level Agreements

Selecting VPN Products and Services

Knowing what's available is half of the battle. Knowing how VPN products and services can be applied to specific enterprise situations is the other half. This discussion will center on evaluating VPN products and services based on specific networking needs. Case studies will be presented to explore the ways in which some companies have implemented VPN technologies to improve their business processes.

- Are VPNs Always the Best Choice?
- Do-it-Yourself VPN Networks
- VPN Network Management and Administration
- Network-based VPN Services
- Fully Managed Services
- A Mini-RFP for VPN Services

The Business Case for VPNs

VPNs promise to deliver savings of between 30% and 70% over some traditional WAN implementations. The question is, where do these savings come from? Explore the cost savings associated with implementing VPN networks and the savings that can be expected. Special attention will be given to the mistakes that some early adopters have made so that you can safely pilot your organization through VPN implementation with minimized risk. VPN customer success stories will be examined as examples of the savings that can be realized.

- The Service Provider Perspective
- The Enterprise Perspective
 - Remote Access
 - VPN WAN Services
 - Managed Services

Future Directions for VPNs

The next 12 to 18 months will see important changes in VPN products and services. Critical standards will be completed, and new standards will be proposed. New classes of VPN equipment will be introduced, and service providers will deliver innovative VPN options. The conclusion of the program will be a discussion of where VPNs are heading, from a technology and market perspective.

- Standards
- Equipment Directions
- Service Innovations and the Impact of New Carriers
- The Converged Enterprise Network — voice, video, and...you name it!
- Market Forecast

Learn from the Leader

The special format of this interactive program fosters an open dialogue among the audience participants, vendor panel and moderators and will offer insight and depth into this critical topic.



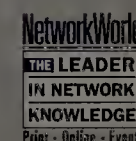
Eric Zines

As a Senior Market Analyst in TeleChoice's Market Research Group, Eric Zines focuses on the rapidly changing Virtual Private Networking (VPN) market. Along with tracking and interpreting trends in the VPN market, Eric also provides consulting services to VPN service providers and vendors.

Prior to joining TeleChoice, Eric worked for a major carrier in a number of different roles, the latest being Product Manager for Intranet Services. He also spent a great deal of time consulting with Fortune 500 customers and advising them on their intranet strategies. Eric also worked as an applications engineer working with some of the first ATM switches, desktop video conferencing solutions, ISDN access equipment, and Internet-enabled applications.

Eric's recent speaking engagements include chairing panel discussions at ComNet and NetWorld+InterOp. He has also served as the keynote speaker for numerous US and international vendor-sponsored VPN seminars. He has written a number of guides on implementing and

marketing VPN services including the recent TeleChoice/*Network World* study on VPNs, and is frequently quoted in the industry press.



Network World Technical Seminars is known throughout the networking community for providing IT professionals with expert, unbiased education on

the latest technologies and trends shaping today's mission-critical networks. This reputation combined with our 100% satisfaction guarantee makes us the educator of choice in the networking industry.



Registration Fee: \$450

Continental breakfast, luncheon and refreshment breaks are included with your registration fee.

Take-Home Materials

- Comprehensive Seminar Workbook which will serve as an invaluable reference during the class and back at the office
- Exclusive Network World VPN CD-ROM resource including related articles, live links and vendor information

Note: If you can't attend, call and order the informative and useful Take-Home Materials kit for just \$99.

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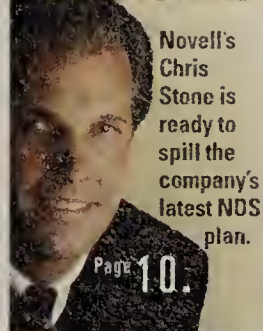
1999 Dates and Locations

- ☐ **Chicago** April 6 Holiday Inn O'Hare
- ☐ **Denver** April 7 Hyatt Regency Denver
- ☐ **San Francisco** April 20 Sheraton Palace Hotel
- ☐ **Seattle** April 21 Renaissance Madison Hotel
- ☐ **Boston** May 4 Sheraton Needham Hotel
- ☐ **New York** May 5 New York Marriott Financial Center
- ☐ **Philadelphia** May 26 Philadelphia Marriott
- ☐ **Washington, DC** May 27 Georgetown University Conference Center



The newswweekly of enterprise network computing

Network World

Digging
in on
DIRECTORIESNovell's
Chris
Stone is
ready to
spill the
company's
latest NDS
plan.

Page 10.

March 8, 1999 Volume 16, Number 10

Breaking news and more: www.nwfusion.com

VALERIE SINGAR

The Global Challenge: BUILDING INTERNATIONAL NETWORKS

CHOOSING A CARRIER: We'll show you the countries where you'll find strong telecom competition — and a variety of services — and those where you'll be lucky to get even basic service from a monopoly. **Page 43.**

BRIDGING BORDERS: Network managers in the trenches share tips for deploying and managing corporate networks that span the globe. **Page 47.**

Beware binding telco contracts

BY DAVID ROHDE

Are you thinking about yanking your voice traffic off the public telephone network and putting it on your own data network? Do you want to replace your frame relay service with an IP virtual private network (VPN)? Are you preparing to use the 'Net for faxing?

Better dust off your telecom contract and check the fine print first. If you move voice

and legacy data traffic to new IP-based transport schemes before your current contract expires, you could set yourself up for a hefty financial penalty.

Why? Because most telecom contracts contain minimum annual commitments (MAC) — obligations by the user to spend a certain dollar amount with the carrier for each year of a term contract. And if you move traffic to a less-expensive — or free — option before the

contract ends, you could fall short of your MAC even if your traffic volume stays the same.

That's why contract consultants are now urging users to demand what are known as technology-displacement clauses in carrier contracts — even if users are only beginning to consider merging their voice and data networks.

These contract additions, also called technology-migration clauses, state that the MAC will be reduced or disregarded if a major technology shift causes a contract ends, you could fall short of your MAC even if your traffic volume stays the same. See **MAC**, page 14

More
Online

- A telecom consultant's look at the "precarious" state of telecom contracts.
- A detailed look at IP convergence and what it means to you.

FIND IT
OneIndex
1842
ON FUSIONwww.nwfusion.com

3Com to bore into backbone

Enterprise chief believes 3Com could be bought.

BY JIM DUFFY

SOUTHBOROUGH, MASS. — 3Com's top enterprise networks official last week acknowledged that the company has made some "unforgivable" mistakes in the enterprise market, but he outlined a strategy he says will propel the firm to the forefront of the emerging market for converged voice and data networks. That is, if

3Com doesn't get bought first.

3Com has set in motion an ambitious plan focused on high-availability products, direct customer relationships and high-profile partnerships that should enable the company to better compete against Cisco and others for large customers' backbone network needs, says Edgar Masri, 3Com's new enterprise networks chief.

However, this strategy is unfolding before an uncertain financial backdrop. In an exclusive interview last week with *Network World*, Masri acknowledged that "customers should be concerned" that 3Com could be acquired as a result of its sagging stock price and a general market slowdown.

"I'm not saying that we'd like to be acquired. All I'm saying is that given the slowdown in the market ... there is a risk that some companies will start looking at us and see

See **3Com**, page 63

The book on 3Com

Strengths:

- NICs
- Desktop and workgroup switches
- Channel distribution
- Sales to small and mid-size businesses

Weaknesses:

- Core backbone switches
- Direct sales, service and support
- Sales to large enterprises

Europeans invade U.S. data market

BY TIM GREENE
AND JEFF CARUSO

With an eye toward helping corporate America build IP-based integrated networks, European telecom vendors are gobbling up small U.S. technology firms.

Siemens will today acquire two privately held data network companies — Castle Networks for about \$300 million and Argon Networks for about \$240 million in cash. European competitors Alcatel, Ericsson and Nokia have spent some \$3 billion in the past

couple of weeks to snatch up U.S. companies in an effort to See **Europe**, page 12

Alcatel strikes again with Xylan. Assured Access buyouts. Page 32.

If you only know Compaq for PCs and servers, do you really know Compaq?



The world's 10 largest telcos use Compaq enterprise solutions. And the next 10. And the 10 after that.

All over the world, the IT bedrock that companies build on comes from Compaq. We've created enterprise systems for 18 of the top 20 U.S. banks. Over 100 stock exchanges worldwide.

Sixty percent of the planet's power generation/distribution systems.

Ninety percent of the world's microprocessor production.

And this isn't just hardware. Compaq delivers complete enterprise solutions. The mission-critical systems that keep business in business.

Who out-integrates the top integrators? Including IBM?

This may surprise you. It's Compaq. In fact, Compaq beat out the biggest names in IT integration in *InformationWeek's* annual poll of IT professionals, finishing second by the slimmest of margins. If you need to get the most out of your IT investment, we don't just have the answer. We **are** the answer.



Where in the world do you do business? No matter: our 27,000 service professionals call 114 countries home.



Whose systems run 17 of the 20 largest stock exchanges, worldwide?

It's the same folks who enable over 60% of the world's interbank transactions. Compaq. With systems and support services that allow hundreds of millions of dollars to flow safely all over the world, every second of every day. It's the ultimate in mission-critical, fault-tolerant NonStop® computing. The kind we provide, not just for the financial world, but for all kinds of industries.

Who knows SAP R/3 like no one else (except, of course, SAP)?

We have over 5,000 R/3 installations under our belts—more than any other competitor. To put R/3's enormous power to work in your business,

why not go with some of the people who know it best?

Who outruns everyone under the sun (including Sun)?

Compaq's lead in high-performance 64-bit UNIX® computing is huge, and growing. For example, we set an all-time TPC-C* record running Oracle8™ on clustered AlphaServer® systems. What does this mean in real life, you ask? It means that we can help you do things in a few seconds that used to take you days.

Who helps millions of e-mail users explain, expound, collaborate and just plain talk?

Compaq systems and support people help run many of the world's largest e-mail systems.

Compaq?

We're also the number one integrator of Microsoft Exchange®, with over 400 global customers. If you've got a large project ahead, remember: We can be a big help.

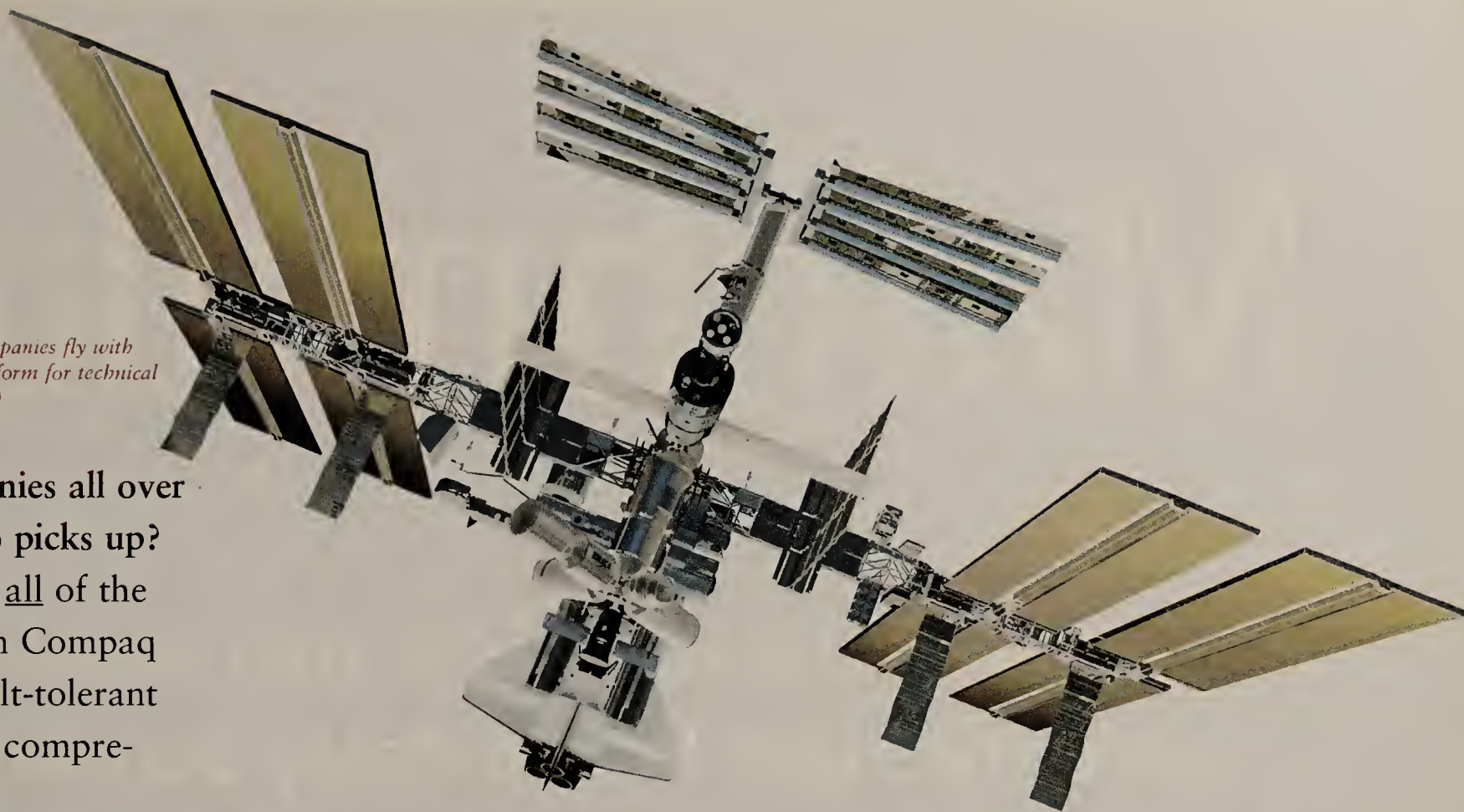
Where does the enterprise store its gigabytes, terabytes and googolbytes?

Once again, we're the answer. Compaq StorageWorks® delivers the widest array of multi-user storage products in the business. And they're designed to solve storage problems for any enterprise, no matter which hardware and software you already use: ours, theirs, anyone's.

AltaVista™

AltaVista—created by Compaq, running on Compaq AlphaServer systems—handles 1 billion Internet searches per month.

All of the world's top 10 aerospace companies fly with Compaq. (There's no better launch platform for technical computing than Compaq 64-bit UNIX.)



When telephone companies all over the world dial 911, who picks up?

Did you know that all of the top 30 telcos depend on Compaq for everything from fault-tolerant NonStop computing to comprehensive disaster relief?

So do more than 170 other telecommunications companies.

If your company could use that kind of reliable, bulletproof computing, why not give us a call?

Who knew?

Ever buy stock online?

Or bank in your pajamas?

Three quarters of the top ISPs choose Compaq to keep millions of subscribers connected. Four out of the five most popular Web sites are powered by Compaq. Microsoft chose us to implement and manage the infrastructure for MSN.com.™

And AltaVista®, the most powerful and useful guide to the Internet? We don't just run it. We invented it.



Even a virtual storefront needs a rock-solid foundation. So thousands of e-businesses, large and small, tap Compaq for systems, solutions, support.

In other words, as enterprise computing moves onto the Internet, it's also moving onto Compaq.

Want to know more?

More details? More case histories? More references? Better answers to the toughest IT challenges there are?

You'll find them at www.compaq.com/betteranswers.

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Security. How much do you think you know about it? Come online and take our mini-quiz, based on questions from the Certified Information Systems Security Professional exam. You'll get graded instantly. **DocFinder: 1844**



Keeping Current. What does it mean when Europeans start coming over here and investing

heavily in U.S. vendors? Fred McClimans takes a look.

DocFinder: 1845

Selecting an ISP. Class is back in session as The Motley Fool explores the basics of Web hosting. This week on Fusion, learn how to write a request for proposal to distribute to ISPs.

DocFinder: 1828

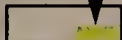
You! We want to know more about you, the *Network World* reader, for our first annual You Issue, coming this July as part of our Signature Series. The You Issue will tell all about your jobs, hobbies, gripes and delights. Help us out by completing our quickie You survey online. If you're interesting enough, you could be featured on the cover of *Network World*. **DocFinder: 1837**

Careers. Shaun Kelly, our new Career Doctor, had to stay late last week answering questions about career changes. Read his advice on whether to get a master's degree in IT, opt for certification or change jobs altogether. **DocFinder: 1731**

Telecom reform. Is it hypocrisy for AT&T to demand that regional Bell operating companies open up their local loops to competitors but then refuse to open up its new cable-telephone network without fees? Discuss it in our forum. **DocFinder: 1831**

How to get onto Network World Fusion

Click on Register on the home page and follow the instructions. Subscribers, keep your NWF number — highlighted on the front cover's mailing label — handy during registration. Nonsubscribers must fill out an online registration form.



NetworkWorld

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Special

Focus

MANAGING BANDWIDTH

How to use bandwidth management devices to stave off net upgrades. Page 30.

FEATURES

The Global Challenge:



BUILDING INTERNATIONAL NETWORKS

Choosing a carrier

We'll show you the countries where you'll find strong telecom competition — and a variety of services — and those where you'll be lucky to get even basic service from a monopoly. Page 43.

Bridging borders

Network managers in the trenches share tips for deploying and managing corporate networks that span the globe. Page 47.

REVIEW: Mirapoint's M1000 and Technauts' eServer 152 thin-server appliances share a dedication to e-mail but target different audiences. Page 49.

COOL TOOLS:

Add-on utilities that make 3Com's PalmPilot even more useful. Page 52.

NEWS BRIEFS, MARCH 8, 1999

Is Intel out of control?

At what point does a company become so powerful that antitrust laws must be applied to regulate its behavior?

That question lies at the heart of the U.S. Federal Trade Commission's antitrust case against Intel, which comes to trial this week.

Legal experts say the conduct Intel is charged with — that it coerced firms into sharing technology patents by denying them access to future microprocessors — wouldn't be illegal when practiced by a smaller, less powerful firm.

But the FTC will argue that Intel is a monopoly and that it exploited its power to snuff out competition and gain a chokehold on the microprocessor market.

Intel doesn't contest most of the facts in the case but argues that the market it operates in is so competitive that its actions were justified and legal under intellectual property law.

Intel is busy outside of the courtroom, as well. The chip giant last week said it would acquire Level One Communications in a stock-for-stock deal valued at \$2.2 billion. Level One, in Sacramento, Calif., makes silicon-level connectivity products for high-speed telecommunications and network applications.

Grab your shopping cart

If you're a net manager as well as a mall rat, www.telezoo.com may be the Web site for you. This new online shopping mall has enlisted major enterprise network, remote access and carrier hardware makers as well as service providers to post their wares and prices.

Visitors can search by product type and then narrow down selections based on specifications. The search engine also fashions side-by-side comparisons of similar gear. Customers can place orders for products online.

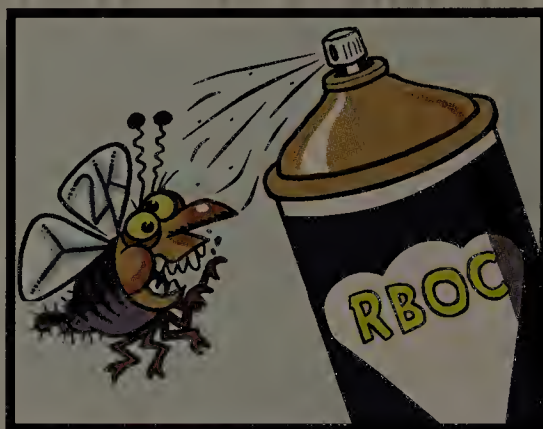
No stinking millennium bug here

Local telco carriers last week said it's unlikely that customers will experience any service disruptions as a result of the Year 2000 bug.

Bell Atlantic, SBC Communications, US WEST, Ameritech, GTE and Cincinnati Bell last week announced the results of a series of Y2K-compliance tests that simulated connections among the seven companies' phone networks.

The regional Bell operating companies, which control some 90% of local U.S. tele-

phone lines, found problems in some cases, but none was serious enough to prevent calls from being completed and all were



STEVE SACK

fixed by upgrading software or making other changes.

Tests among the local carriers and long-distance and wireless companies have not been completed.

How to be heard on the Internet

AT&T, Lucent, Motorola and 17 other firms last week formed the Voice Extensible Markup Language (VXML) Forum to work on a standard for voice- and phone-enabled Internet access.

The VXML standard should lead to new interactive business applications for call centers, banking transactions and electronic commerce.

The forum expects to have a standard posted on www.vxmlforum.org/ or www.vxmlforum.com/ in April or May.

After public comments and contributions to the specification are taken into account, the forum intends to submit a final proposed specification to the World Wide Web Consortium, which it is expected to do later this year.

The Gates e-commerce directive

Let's bring one million new businesses online using Microsoft electronic commerce software before year-end. That's CEO Bill Gates' new plan.

Microsoft last week revamped its e-commerce strategy with the introduction of BizTalk, a new technology framework based on the Extensible Markup Language.

BizTalk is designed to let firms with different computer systems more easily exchange the data required for e-commerce, such as product information and purchase orders.

Microsoft is working with partners and vertical industry groups to define useful schemas for BizTalk.

Gates said all Microsoft e-commerce software after the debut of Windows 2000 will support BizTalk. The framework will also be freely available for other vendors to support, Gates promised.

IBM/Dell duo does not scare Compaq

BY MARC SONGINI
AND DENI CONNOR

ARMONK, N.Y. — IBM and Dell stepped into the same corner of the ring last week, but it looks as though they'll just be delivering a jab — not a knockout blow — to rival Compaq.

Dell last week agreed to put \$16 billion worth of IBM components into its products over the next seven years. Dell cut the deal with IBM's recently formed Technology Group, which includes the Networking Hardware Division (NHD) and IBM's storage and microelectronics divisions. IBM's OEM business has been

president of Communications Network Architects, a Washington, D.C. consultancy. What it does mean is that technologically conservative Dell will now have a chance to exploit IBM's rich portfolio of intellectual property, he says. "Expect to see Dell's equipment become as current as anyone's," Dzubeck says.

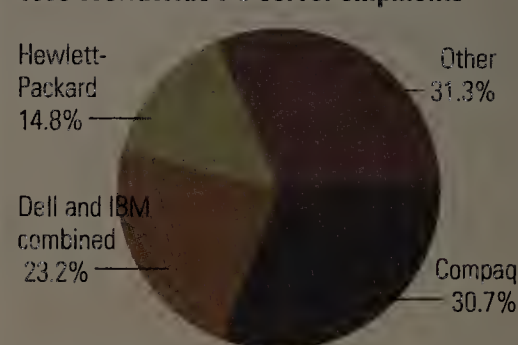
"No one company can do it all by itself," says Mike Lambert, senior vice president of Dell's Enterprise Systems Group.

Compaq officials say they are not getting sweaty palms over the venture. "We do not see this deal as any threat to our position in the market," the spokesman says.

Stacking up

Compaq's hold on the PC server market will not be loosened by the IBM/Dell deal.

1998 Worldwide PC server shipments



Total 1998 shipments: 270,855

SOURCE: IDC, FRAMINGHAM, MASS.

Worldwide PC server revenue:

Compaq	\$3.8 billion
Dell and IBM	\$3.1 billion
Hewlett-Packard	\$1.7 billion

growing 40% per year for the past six years.

Dell expects to buy IBM Token-Ring network interface cards, high-capacity disk drives, flat panel displays, static RAM and custom-made chips. Sources say IBM may also supply Dell with various types of network gear, its state-of-the-art high-capacity copper and silicon-on-insulator chips, and perhaps other intellectual properties. The two companies could also build products together, officials say.

The cooperation of IBM and Dell is far from a death sentence for Compaq, the leader in the PC and server markets.

"This is not going to stop Compaq," says Frank Dzubeck,

A match made in Armonk

The deal allows Dell to buy components from other OEM vendors, such as Intel, which provides the CPUs for Dell PCs. The agreement only covers IBM's Technology Group: the PC and server groups will be competing as fiercely as ever with Dell.

"We're ecstatic about the deal," says Ash Shehata, chief information officer of Antelope Valley Health Care Systems, an acute-care facility in Lancaster, Calif.

"We would love Dell to come up with the leading technologies, but it is intelligent enough to realize it needs to make best of breed, mix and match products," he says. ▀

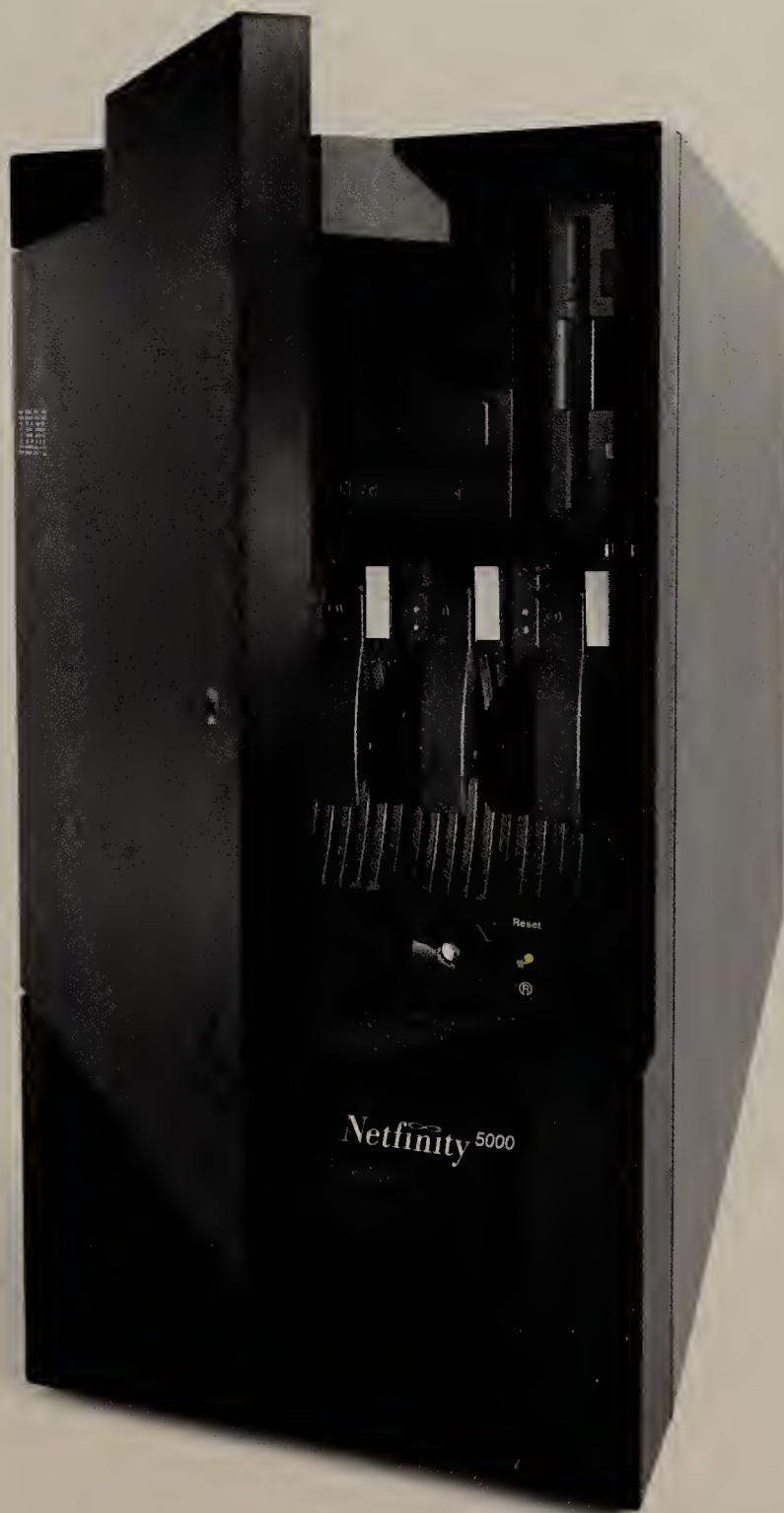
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2005: A Microsoft odyssey

Our crystal ball reveals a possible future in which Microsoft has been split into four parts.

BY CHRISTINE
(CLARKE) BURNS

First in a three-part series.

Win, lose or draw, the government's highly publicized antitrust case against Microsoft will change how the company conducts business for years to come. And just what those changes might be has been the subject of the wildest of imaginations.

Granted, the trial isn't over; It's only recessed until mid-April. But the smell of blood is in the air. Microsoft's legal missteps and the endless amount of executive half-truths exposed by government lawyers have shaken the defense. By most accounts, the government is winning. Assuming it does: What's next?

Some say treat Microsoft like the grand monopolies of yore and carve it up. Others say open up Windows source code to the free world. A third, more conservative faction suggests keeping Microsoft structurally intact but limiting its more controversial business practices.

In this three-part pseudoscience fiction series, we will illustrate just how these three scenarios might play out. While based on dozens of conversations with legal types, industry analysts, Microsoft partners and users, this series does exercise some artistic license as it takes these opinions and uses them to form a picture of the future.

So let's step into the Microsoft time machine, shall we?

The year is 2005. It's been five years since the Microsoft Empire was split five ways. MS1 has Bill Gates and Windows. MS2 and MS3 — originally separate companies selling desktop and server applications, respectively — have merged under the leadership of sales guru Steve Ballmer. Former Internet Explorer guru Brad Silverberg came out of retirement to take the reins of MS4 — the entity that builds application development tools. Video expert Jim

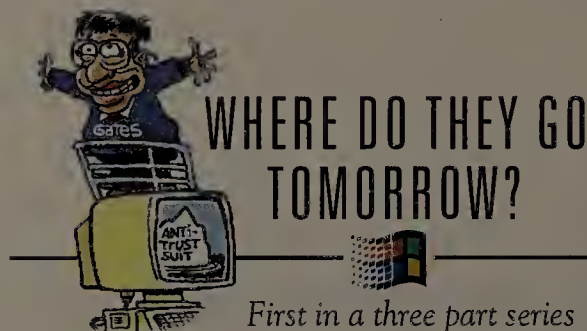
Allchin heads up the consumer games business of MS5.

Where did Bill go tomorrow?

Bill Gates sits in the same rumpled Redmond, Wash., office as he did as CEO of Microsoft proper before the turn of the century, pondering the same basic question he's asked of his company for nearly 20 years: How can Windows make me more money?

The swivel of his heated leather chair lets him view the multiscreen Windows 2004 PC on his desk and the WebTV network device covering the north wall without getting whiplash. Gates is physically comfortable, but his blood is boiling thinking about how he has to pay former partner Steve Ballmer more for the MS2 browser than he shells

Windows-only business, when OEM revenue more than doubled. He silently thanks the U.S. judicial system, which ruled that Gates could not cut any special deals. So now everyone pays top dollar, regardless of volume or special side deals. Gates looks away from the bank of flat screens to remember that call to Compaq back in 2001 when Gates broke the news to CEO Eckhard Pfeiffer that Gates was legally bound to triple Compaq's cost of licensing Windows.



one-time \$100,000 charge per application. But with hundreds of thousands of Windows programs shipping, Gates knows that MS1 stock will always be a Wall Street darling.

His only regret? That this money-making plan isn't making him any new friends and is harming a handful of long-term relationships. Old-time pal and now MS2/3 crew chief Ballmer publicly and frequently rails against the Windows licensing fee.

Bill tenses as he thinks about the virtual Comdex show attended by 10 million Web browsers where Ballmer gave the keynote, "The Top Ten Ways to Not Give Bill Your Money." The No. 1 method: Build your applications on top of anything but Windows.

computer science or those with some kind of a beef against the M1 CEO. That taken together turns out to be about 9.8% of the population.

Finding ways to needle Bill — like supporting Linux — is what Ballmer likes to do in his spare time. Unfortunately for Steve, the MS2/3 applications don't have the home-field advantage that they used to under the united Microsoft. Oh yeah, immediately after the split, all of the BackOffice programs stood heads above their competition because the MS 2/3 engineers still had intimate knowledge of Windows 2000. Ballmer slept easy at night knowing no other Windows independent software vendor (ISV) had been in bed — so to speak — with the underlying operating system, as he had.

But Bill's onto new things now. He's been talking about Windows 2004 for three years and has sold off the rights to every API imaginable to any ISV with cold, hard cash. Gates knows his old partner has lost his Windows sugar daddy and that Steve's 10-mile morning run is fueled by his fear of hav-

Imagine if . . .

Microsoft gets broken up into pieces?

Network World blue skies about who would rule the roosts:



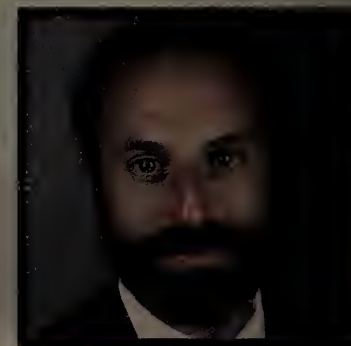
Jim Allchin might sharpen his video skills as head of the consumer games division.



Sales guru Steve Ballmer might be able to keep pushing desktop and server applications.



Bill Gates would likely get Windows.



Brad Silverberg could come out of retirement to handle development tools.

out monthly for his T-7 link to the Internet. But then again, Gates knows that paying Ballmer is better than using America Online's industry-leading freeware.

To Gates, sticking with a Microsoft-inspired browser is a matter of principle.

Gates clicks over to his net worth icon, secure in the knowledge that his Windows monopoly is safe and his stock is still rising. He reflects on the first two years of the

"Yeah. Yeah, Eckhard. I know that Podunk PCs only sold 100 Windows machines last year. But my hands are tied! I can't cut deals. I have to charge everyone the same price for my operating system," Gates fondly remembers saying.

It was about that time that Gates latched onto another idea to keep Windows profits rolling: charging every application developer who builds on top of Windows. Gates kept the licensing fee at a modest

Ballmer wasn't done. He then announced to the world that he had hired Linux point man Linus Torvalds as lead product manager for The WayBackOffice suite. This package now includes a Linux-based mainframe replacement, 24-way real-time video and corporate cyber-catering services. And it is half the price of the similarly featured Windows BackOffice suite. Bill reminds himself that Linux is still only used by those with Ph.D.s in

ing to compete fair and square with the likes of Lotus and the Netscape division of AOL.

"Now we have to actually build software that actually works better than the other guys, and we have to ship it on time," Ballmer was quoted as telling his senior staff at a retreat recently. "Anybody ever have to work that into their long-term strategy before?"

Coming next week, a look at Scenario 2: What happens in a free Windows world? ■

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Novell opens up its directory strategy

BY CHRISTINE
BURNS

PROVO, UTAH — Over the next few weeks, Novell will begin the battle to persuade corporate customers to use the next release of its directory service instead of Microsoft's yet-to-be-released Active Directory.

Novell's release — which will be called Novell Directory Services Version 8 (NDS 8) — will be standards-based, more scalable and will have the ability to synchronize information contained in its data store with that of other directories.

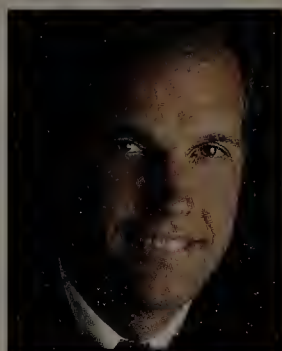
While NDS 8 won't ship for another 12 to 18 months, the company last week started briefing industry analysts. Novell will hold a press conference today, and two weeks from now it will tell all to 6,000 of its loyal users at the annual Brainshare conference in Salt Lake City.

NDS 8 will be a native Lightweight Directory Access

Protocol (LDAP) implementation, which will make the directory service accessible by any client software, able to host any application, and capable of interoperating with other directory services that support the emerging LDAP standard, say sources familiar with the product. Novell already offers add-on LDAP support, but native support will provide end users with LDAP-based client software so they can get to NDS information more quickly. This deeper-level support for LDAP will also provide better interoperability with other LDAP-based directories, such as those from Netscape and Oracle.

NDS 8 will run on multiple operating system platforms including NetWare, Windows

2000, Linux, Sun Solaris and IBM's OS/390 mainframe system. NDS 8 will use meta-directory features supplied by



Stone says NDS 8 has been tested with up to a half-billion objects.

Novell's Utah neighbor NetVision that will allow the directory to automatically synchronize user information with Lotus Notes and Microsoft Exchange databases. Company officials say NDS 8 is so scalable that there is no limit to the number of directory objects it can hold.

NDS 8 will scale in two ways (NW, Feb. 8, page 6). For corporate use, Novell will make NDS simpler to distribute and easier to manage across multiple sites. From its inception, NDS was built to be distributed, but NDS 8 has features such as federated partitions, which let an IS manager establish autonomous

directory segments according to corporate structure. For the more centralized directories required by ISPs that want to offer Web services on a per-user basis, Novell has changed the underlying NDS database technology to hold huge amounts of directory data.

At an analyst briefing held last week in Boston, Chris Stone, Novell's senior vice president of strategy and corporate development, said NDS 8 has been tested with up to a half-billion objects — directory entries such as a user name, password or security certificate. The current version of NDS supports one million objects.

Industry analysts familiar with the overall plan say Novell's NDS marketing effort is a thinly veiled attempt to fend off Microsoft's yet-to-be-shipped Active Directory.

"Hands down, NDS 8 is impressive," says Laura DiDio, an analyst with the Cambridge, Mass.-based Giga Information

Group. "And technologically, Novell has got a three- to four-year lead on Microsoft. But in reality, Novell only has a six- to nine-month window to convince the world of that before Active Directory starts taking hold."

Novell must make some drastic marketing moves — such as reducing or even eliminating the \$26-per-end-user fee it charges for NDS for NT — so more current users running NT can get a look at NDS 8 before they see Active Directory, DiDio says.

Analysts are less convinced that Novell will make any headway in the ISP market, in which Netscape has been pushing its LDAP-based directory for over two years now.

"Netscape has done a much better job pushing the Internet applications that can tap into the directory," says Jon Oltsik, an analyst with Forrester Research Group in Cambridge. "Novell has its roots in the corporate world. They're going to have trouble breaking out of that without a really hot product soon." ■

Novell is looking to preach the 64-bit sermon

BY CHRISTINE
BURNS

PROVO, UTAH — With a 64-bit version of NetWare called Modesto, users can expect to get the performance they need to run networked applications

that were previously reserved for high-end Unix boxes.

Sources say Modesto — which will be announced in the next couple of weeks — will run on yet-to-be-released 64-bit chips from Intel. Modesto will be built from the

ground up as a modular operating system, which means applications will be able to tap directly into the operating system services they need instead of running on top of a general services layer. This direct access will reduce system overhead and increase performance. Modesto will also have a Java Virtual Machine, which is expected to boost the performance of server-side Java applications, sources say.

Novell will support backward-compatibility for all applications and network services, such as Novell Directory Services and Novell Storage Services, written for NetWare 5.

Users say Novell's effort to spread the word about Modesto early in the software's development is key.

The IT staff at the Robert Emmett McDonough School of Business at Georgetown University in Washington, D.C. is anxious to get the performance enhancements to run more labor-intensive interac-

tive applications, such as online classroom instruction.

Senior Network Engineer Larry Bradley says the business school would also look to Modesto to improve the performance of Oracle applications. "We want to use Oracle because of the management ties it has to NDS," Bradley says. However, the staff needs to get better application performance than it gets now with NetWare 4.X and 5.0.

But Tom Ferris, a network consultant with a large international financial institution, also in Washington, can't pinpoint any applications he would want to run on Modesto.

"In any case, I'm still interested in Novell's plans to deliver a 64-bit version of NetWare because it will be an indication of how well they're keeping up with the rest of the industry," Ferris says.

Novell first broached the idea of a 64-bit version of NetWare last year at the company's annual Brainshare users

group conference. Novell has been relatively silent about the effort since then, other than to say Modesto will ship when Intel makes its Merced chips available. The Merced target release date has been delayed several times and now stands at mid-2000.

Company officials declined to comment on whether Modesto will take center stage at this year's Brainshare in two weeks. They would only confirm there would be a related announcement early next month. ■

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More Online

- A Novell white paper on Modesto.
- A look at the architecture of the 64-bit chip on which Modesto is based.

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Alcatel/Xylan deal not just about 'convergence'

Alcatel expects to grow Xylan revenue from \$348 million to \$1 billion in two years.

BY JEFF CARUSO

Voice and data convergence are the reasons Alcatel cited last week for its plan to buy Xylan, but the fact is Xylan sorely needed the boost.

Like other telecom vendors, Alcatel has begun adding data network technology to its voice expertise through acquisitions. Alcatel will shell out about \$2 billion for Xylan, plus \$350 million for Assured Access Technology, a Milpitas, Calif., maker of access concentrators.

Alcatel purchased Gigabit Ethernet start-up Packet Engines last fall, and the company has resold Cisco and Xylan gear for several years.

Alcatel declined to provide specifics on how it will integrate Xylan's gear with its

own, but it pledged to elaborate on its plans next week. Xylan hasn't been too aggressive in the voice market to date, but the company supports voice through its ATM gear and recently boosted its efforts to sell to carriers.

The idea of combining voice and data onto the same network is striking a chord with some users. Lockheed Martin, for instance, has been looking into IP telephony products, says Joe Anderson, lead member of the company's engineering staff. Though it hadn't considered Alcatel before, Lockheed may evaluate the vendor because Lockheed already uses Xylan equipment, he says.

Helping out

Alcatel's offer helps Xylan

out of a bind. Although Xylan is profitable, the company had been running into increased competition in the network hardware market, mainly from Cisco. Analysts say Xylan has been following a strategy similar to Cisco's — selling a range of stackable and chassis-based products with a variety of interfaces — but on a smaller scale and with fewer marketing resources.

"We will now be able to compete on equal terms," says Steve Kim, CEO of Xylan, which will remain relatively autonomous as a wholly owned subsidiary of Alcatel.



Xylan CEO Steve Kim says getting acquired by Alcatel will let Xylan compete on equal terms with the likes of Cisco.

But even the combination of Alcatel and Xylan will have difficulty getting its marketing message heard above those of Cisco and others, says Craig Johnson, an independent consultant in Portland, Ore. Xylan built its reputation on its any-to-any switching and virtual LAN technologies, but these

are becoming less important differentiators, he says.

Because Cisco's equipment overlaps somewhat with Xylan's, Alcatel says it will evaluate its deal to resell Cisco gear on a "case-by-case" basis. Xylan's equipment is also resold

by several vendors, in deals representing about a quarter of Xylan's revenue. The largest of the Xylan resellers is IBM. Kim says the deal with IBM will be unaffected by the acquisition.

Alcatel says Xylan will become the "center of competence" for the combined company's enterprise data network gear. Alcatel expects to grow the subsidiary's revenue from \$348 million last year to \$1 billion in the next two years. The deal is expected to be completed in April.

Assured Access, which makes remote access products for the carrier market, will be grouped with Packet Engines under Alcatel's new Internet division, and will be headed by Martin de Prycker. Alcatel's acquisition of Assured Access is expected to close in two weeks. ■

Europe,
continued from page 1

grow beyond their traditional voice network roots and gain a foothold in the growing IP convergence arena (see graphic).

Having watched their chief North American rivals, Cisco, Nortel Networks and Lucent, bulk up on choice data firms, the European vendors are left to find what they can among promising start-ups.

"These European carriers have decided that to be successful, they have to get into data. And they have lots of cash to spend," says Todd Dagres, a venture capitalist with Battery Ventures.

The companies will have to develop some name recognition as well. While Siemens is ranked third in sales of business and carrier phone switches, behind Nortel and Lucent, the other European carriers are less well-known in the U.S. Alcatel, based in France, sells telco switching gear. Nokia, in Finland, and Ericsson, in Sweden, enjoy international reputations as providers of wireless and wire-line phones and switching gear, but they lack significant market share in the U.S.

The European companies are following their U.S. counter-

parts in moving to packet-based technologies, analysts say.

"European companies are looking at the fact that circuit switches are dying," says Frank Dzubeck, president of Communications Network Architects. To stay in the

data interfaces. But with changing carrier demands, it is difficult for these vendors to know exactly what they need to buy.

"Nobody knows what the voice/data converged world will look like," says Craig

Johnson, an independent consultant in Portland, Ore. That means the big telecom companies have to cover all the bases, and they have to control some data network resources.

"To win, you have to own this stuff; you can't just OEM it," Johnson says.

Without owning the technology, it cannot be tightly integrated into their product lines, says Tom Bentley, managing partner of merger and acquisition specialists Alliant Partners.

In addition to technology, the European communications giants want U.S. customers, experts say. Alcatel, for example, is buying its way into some top U.S. accounts with its purchase of Xylan, Dzubeck says. But the fact that Alcatel is based in France could pose a problem in some cases.

For example, the buyout might have repercussions for users working with the federal government, which sometimes disallows the use of foreign-made equipment in its facilities.

Buying companies that are less established than Xylan brings along fewer customers, Dzubeck notes.

Siemens: Stock of its own

Siemens today is expected to announce that it is setting up a Boston subsidiary that will issue stock of its own rather than being an arm of Siemens' parent company. Siemens plans to tap Martin Clague, presently general manager for global network computing solutions at IBM, to become CEO of the new venture, sources say.

The spinoff, known internally as Siemens.com, will be able to purchase U.S. companies using

stock as a currency rather than cash. This is because with its base in the U.S., Siemens.com can use a financially advantageous procedure called "pooling of interests."

Pooling lets companies value purchases by generally lower "book" value rather than higher "market" value, saving on taxes and charges against earnings.

Because Siemens is currently based in Germany, it is controlled by different laws and cannot take advantage of pooling, Alliant Partners' Bentley says.

Stock will also help Siemens.com hang on to the most important asset gained in any acquisition: skilled people. The company will be able to offer employees stock options so they will have a tangible stake in the company's success.

The alternative incentive is cash, but many employees might just take it and walk away, Battery Ventures' Dagres says.

Rumors also swirled last week that Siemens would buy for about \$1.2 billion the unit of 3Com that sells telco gear. Executives declined to comment on the gossip. ■

The continental technology buyers

European communications firms are buying American to complete their technology needs.

Company	Traditional market	Purchase/cost	Target markets
Alcatel	Carrier phone switches	Assured Access / \$350M, Packet Engines / \$315M, Xylan / \$2B	Enterprise customers, packet voice
Ericsson	Wired and wireless phone gear	ACC / \$285M	Packet voice
Nokia	Wired and wireless phone gear	Diamond Lane / \$125M, Ipsilon / \$120M	Digital access, packet voice
Siemens	Carrier phone switches, PBXs	Argon / \$240M, Castle / \$300M	Packet voice

game, the firms have to buy data technologies.

The European vendors are approaching their data acquisitions differently, however. Alcatel, for example, is clearly making a push to sell more enterprise network gear (see related story, above). Siemens, Nokia and Ericsson are focused on buying access gear that brings packet technology to customers and then presents them with voice and

Johnson, an independent consultant in Portland, Ore. That means the big telecom companies have to cover all the bases, and they have to control some data network resources. "To win, you have to own this stuff; you can't just OEM it," Johnson says.

Without owning the technology, it cannot be tightly integrated into their product lines, says Tom Bentley, managing partner of merger and acquisition

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Platt has radical answer to HP's problem

BY DENI CONNOR

Although Hewlett-Packard CEO Lew Platt is reaching retirement age, he is not afraid of change.

If he were, he never would have split his company into two parts, a radical move that analysts say will boost HP's flagging revenue and spur innovation.

The bigger half will keep HP's name and focus on the company's core business — computer hardware, software, printing and imaging.

The smaller, still-unnamed chunk will concentrate on testing and instrumentation products. This area represents only 16% of HP's revenue, some \$8 billion in all.

Shortly, HP will reveal plans to offer Internet business services. The services will include "outsourced computation, storage, printing or data mining; business-to-business

services such as accounting or procurement; application services such as pay-per-use software and consumer e-services of all kinds," says Platt, who declined to offer further details.

Customers are optimistic.

"We have worked some with HP on Internet services and would definitely be interested in working with them more on e-business, based on our relationship in other areas," says Max Ward, vice president of technology for Staples Office Supply in Framingham, Mass.

Analysts applauded the move to bring focus to HP's computing efforts.

"Because HP had so many different business units, every business unit had its own strategy that really didn't tie into other business units' strategies. Everyone was running in a different direction with no clear focus on where to put resources," says Amir Ahari, industry analyst at International Data Corp. in Framingham, Mass.

Platt will step down as CEO in a year to a year and a half. In the meantime, he will be instrumental in refocusing HP, analysts believe.

HP is looking outside and inside the company for a Platt replacement. "For HP to extend the search outside the company is a very radical move.

HP needs an aggressive new person to serve as CEO and handle the new company," says Kevin Fong, a former HP employee and now a venture capi-

talist with the Mayfield Fund in Menlo Park, Calif.

The company may find that person

in-house, Fong says. Ann Livermore, vice president of the Enterprise Computing Solutions Organization, has

been mentioned as a replacement for Platt. HP confirmed that Livermore is on the short list. ■

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MAC,
continued from page 1

money-saving WAN service to become a viable option. Without such a clause, experts say, you could be putting yourself out of the convergence market for the entire term of your next contract.

You can risk financial penalties even if you don't make a substantial technology shift. For example, many organizations' internal 800-number applications are being replaced by simple e-mail, says Dick Kuehn, president of RAK Associates, a Cleveland firm specializing in telecom contract negotiations. In one client's case, 800-number volumes recently fell off for this reason. "The carrier came in and said, 'You missed your commitments.' Now we are having a major fight over it," he says.

Technology-displacement clauses have been "absolutely key" in Yale University's carrier deals, says John Meickle, Yale's director of telecom planning and technology.

Yale's telecom unit provides myriad voice and data services — including long-distance telephony — to the campus community by buying bulk contracts from carriers. "But now our user community substitutes e-mail for long distance," Meickle says. Some students and faculty members have also used voice over IP internationally, as well as pre-paid calling cards.

"We can't internally lower our rates fast enough," Meickle notes. As a result, in one three-

year carrier contract, Meickle negotiated a 15%-per-year drop in the overall MAC. In another contract, "we have [service] substitution clauses all throughout it," he adds.

Devil is in the details

But don't be fooled, consultants warn. Some carriers will present technology-migration contract programs that don't necessarily protect against MAC penalties.

For example, AT&T offers two programs — the Data Services Volume Pricing Plan and the OneNet Basic Telephony Bundle — that offer some flexibility for switching among private-line, frame relay and other services during the course of a contract.

"But none of AT&T's standard programs offer technology-migration clauses with teeth," says Hank Levine, a partner in the Washington, D.C. law firm of Levine, Blaszk, Block and Boothby. A problem arises because the MAC in dollar terms remains the same in both these programs, meaning you'll have to make up per-minute or per-byte cost savings with new traffic to avoid a penalty.

Debbie Shashaty, lead communications consultant for Reynolds Metals in Richmond, Va., says the wording of a technology-displacement clause should be as broad as possible. Otherwise you risk missing the point of the clause — to anticipate the unanticipated.

Reynolds' contract with AT&T gives Reynolds broad discretion to move among ser-

vices — currently frame relay and potentially ATM and VPNs — so long as the traffic stays with AT&T. Not only that, it's a combined voice/data contract with an overall corporate MAC, Shashaty says. If Reynolds had separate voice and data contracts, she says AT&T could claim a shortfall on the voice traffic if it was moved to the data network, and therefore invoke a penalty.

Yale's Meickle negotiated wording stating: "In the event of an upgrade reflecting a new, more cost-effective service, the customer's commitment shall be lowered commensurately."

Carriers will resist this kind of wording unless you threaten to take the business elsewhere, Meickle says.

"I was actually the one who suggested this wording," he says. "At first they said 'no,' but then they said 'yes.'"

RAK Associates' Kuehn suggests another approach: Ask the carriers for a MAC in minutes rather than dollars. That way, at least on the voice side, a customer can commit to the same traffic volume for progressively lower fees. "Sprint will do minutes rather than dollars," Kuehn says. "The others you have to fight."

MCI WorldCom officials say they avoid minute deals and, so far, offer dollar-based MAC-reduction options sparingly. "The consultants are using it to drive negotiations with our customers," complains Ron McMurtrie, vice president of product marketing for MCI WorldCom. But on a case-by-case basis, technology-displacement deals with MAC reductions are available, McMurtrie says.

AT&T likewise will negotiate firm technology-displacement deals on a custom basis. For a highly sought-after customer, "it's not in our interest not to work something out," says Steve Sobolevitch, AT&T's director of business-markets pricing.

Sprint offers no standard mid-contract MAC-alternation

clauses but will work with users on a case-by-case basis, a spokesman says. Under its Sprint Technology Evolution Plan, the carrier offers a set of equipment leasing and other incentives for customers making WAN migrations.

What's a MAC?

A MAC, or minimum annual commitment, is the amount of money a user organization agrees to pay a carrier each year of a multiyear contract in exchange for negotiated discounts. The penalty for not meeting the MAC is usually either the entire amount of the shortfall or a pre-arranged alternative, such as 70%.

Another gambit

As an alternative to technology-displacement clauses, some consultants suggest that users ask for volume commitments — particularly for individual services — to apply over the life of a contract rather than each year or month. That way, Kuehn notes, growing traffic volumes can pay off your commitment to that service early — much like paying off a mortgage early — leaving you free to implement a new WAN technology.

But whatever you do, consultants urge users not to accept so-called "will talk" or "agree to agree" clauses to deal with MAC shortfalls. These clauses, often pushed by carriers, simply mean that the two parties will sit down in case of a mid-contract volume problem and work something out.

That solution, Levine says, almost always involves stretching the contract out to an even longer contract commitment, further delaying potential migrations.

Or as Yale's Meickle put it: "If they're pushing the contract, it's going to be in their favor. You need to work so that it's equitable to both sides, or in your favor." ■

Today's contract imperatives

Don't know what the next three to five years hold for your company and the IS market? Consider the following additional provisions in a multiyear telecom contract to protect against the unpredictable.

1 Business-change clauses.

Provides for: Reduction in MACs in case of corporate divestitures or sell-outs. Reason: Network expenses will be consolidated or reduced if your company is sold or business units are purchased. You want to avoid penalties.

2 Business-acquisition clauses.

Provides for: Adding volume to your contract in case your company makes an acquisition. Reason: Your contract probably has better rates than the company you're acquiring, and you don't want to be stuck with their rates.

3 Competitive termination clauses.

Provides for: Early end to contract if market rates drop dramatically and a competitor offers an alternative. Caveat: Existing carrier should be given

the right to make a new offer within 5% of the competitor's rate. Reason: Long-distance carriers' fees paid to local carriers are dropping, and you want to gain the benefit.

4 International clauses.

Provides for: Automatic rate-reopening each year for international traffic. Reason: These rates are expected to come down significantly over the next three years. The FCC's policy of forcing down international settlement rates is working, and foreign competition is taking hold.

5 IntraLATA toll clauses.

Provides for: Removing volume commitment for toll calls within a metropolitan or regional area. Reason: Keeps you from being charged twice for the same traffic.

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THE WORLD'S INTERNET COMMUNICATIONS COMPANY

AT&T gives nets \$6 billion boost

BY DENISE PAPPALARDO

AT&T is shelling out \$6 billion to

build more local services, bolster its packet-voice position and blend its two Internet backbones.

Building local services is one of the long-distance carrier's big challenges. AT&T has already spent billions of dollars acquiring competitive local exchange carrier Teleport Communications Group (TCG) in July 1998 and Tele-Communications, Inc. (TCL) last month. The acquisitions give AT&T last-mile access to

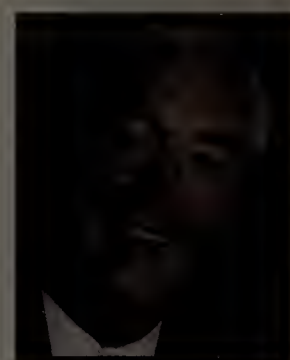
business users through TCG's local-loop networks and to residential customers through TCI's hybrid fiber-coax network.

Now AT&T intends to spend up to \$2 billion to add 5,000 to 18,000 local-loop route fiber miles throughout the country. Today, AT&T has 13,000 local-loop route fiber miles.

AT&T plans to offer local services in at least 15 new markets by year-end, bringing the number of cities covered by AT&T local service to 98, says Frank Ianna, executive vice president of network services at AT&T.

The company's local push will also be helped by the wireless 38-GHz microwave spectrum acquired in the TCG deal. AT&T plans to expand point-to-point wireless service to 500 more buildings by year-end, bringing to 800 the number of buildings where the service will be available. Business users in these buildings will be able to subscribe to AT&T's wireless local access services.

AT&T's \$11 billion acquisition of TCG not only gave AT&T local-loop facilities, but also TCG CerfNet, a national ISP focusing on business IP services. While AT&T has had this asset for nearly nine months, the CerfNet back-



AT&T's Ianna says the carrier will bring local service to at least 15 new markets this year.

bone is still not integrated with AT&T WorldNet, the carrier's existing ISP arm.

This year, AT&T plans to bring the two networks together by installing OC-48 fiber optics so the networks can support higher-speed transmissions. AT&T will use the OC-48 pipes to set up connections between the networks creating, in practice, one 'Net backbone.

AT&T is also beefing up its ISP network with a slew of Cisco 12000 Gigabit Switch Routers and with the addition of new ISP peering connections.

While putting much of its focus on data, AT&T is also preparing its circuit-switched network to handle both traditional voice and packet-voice traffic. AT&T will install 120 edge devices that support packet-based voice traffic and will spend less on its core Lucent 4ESS voice switches. In fact, AT&T hopes to stop investing in 4ESS switches altogether by 2000, Ianna says.

The edge devices that AT&T is adding to its voice net include Nortel Networks' DMS Succession and Lucent's 5ESS with Multiservice Module voice switches. These products support circuit-switched traffic and packet-based traffic, Ianna says. Many businesses are evaluating or already using IP or ATM voice applications, and AT&T is trying to stay ahead of this curve by preparing its net to easily support packet-voice traffic. ■

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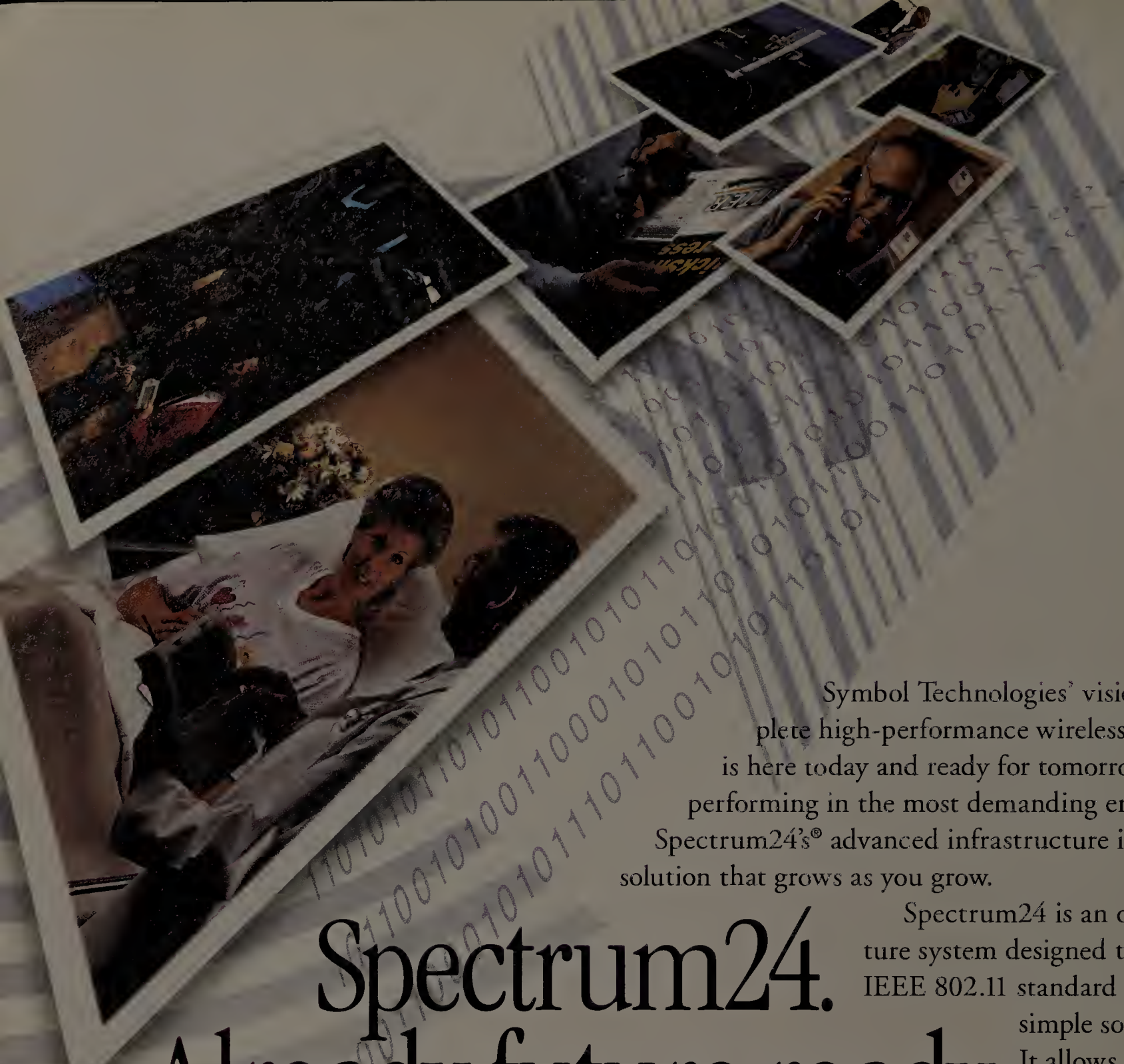
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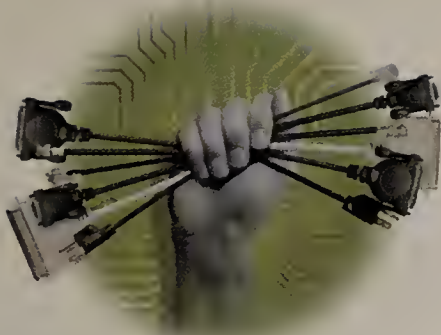
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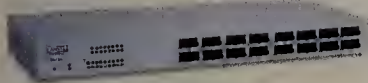


Infrastructure

**TCP/IP, LAN/WAN Switches, Routers, Hubs,
Access Devices, Clients, Servers, Operating Systems, VPNs**

Briefs

LANart has announced eight- and 16-port stackable 100Base-FX hubs. The devices support multimode or single-mode fiber and can be stacked up to five high for as many as 80 ports in a single system. The unmanaged



LANart's 16-port hub works in multimode and single-mode fiber nets.

hubs are available now. An eight-port multimode version costs about \$2,200, while a 16-port version costs about \$3,700.

LANart: (800) 292-1994

Allied Telesyn has rolled out an autosensing 10/100M bit/sec Ethernet adapter for PCI computers. The 32-bit AT-2700 is available in copper and fiber configurations and supports the OnNow and ACPI power management specifications outlined by Microsoft. The device costs \$70 for the copper version and \$255 for the fiber edition.

Allied Telesyn: (800) 424-4284

Hewlett-Packard has taken the wraps off a 24-port 10/100M bit/sec Ethernet switch priced at \$89 per port.

The ProCurve Switch 2424M has a slot for Gigabit Ethernet uplinks and a Web interface for managing the switch remotely. The switch is shipping now; pricing for Gigabit Ethernet uplinks starts at \$899.

In addition, the company introduced the ProCurve Switch 2224, a 24-port unmanaged 10/100M bit/sec Ethernet device, priced at \$999.

Two 10/100M bit/sec Ethernet hubs are also available: a 12-port hub for \$699 and a 24-port version for \$1,199.

HP: (650) 857-1501

FORE broadens its network appeal

The ATM leader rounds out its product line with Ethernet switching and carrier offerings.

BY JEFF CARUSO

PITTSBURGH — FORE Systems throughout the rest of this year will continue its transformation into a switch hitter.

Make no mistake — FORE is not giving up its core strength in enterprise ATM. But the company is broadening its scope by developing more non-ATM technology and making its products appeal to enterprises and service providers.

As part of the transformation, FORE by mid-year will phase out some of its older product lines, said CEO Thomas Gill at a recent BancBoston Robertson Stephens conference in San Francisco. Though he didn't identify which products would get the ax, Gill said they would be those that are "redundant with our Layer 3 strategy."

Industry analysts say the products to be phased out would be those remaining from the days when FORE took the stance that all roads led to ATM. Over the past

product based on frame/cell switching technology code-named Hydra. FORE first revealed its Hydra plans last year when it said Hydra would appear in a WAN access switch by the end of 1998 (NW, July 27, 1998, page 1). The switch didn't appear by then, but FORE says that the WAN switch will be announced in coming weeks.

At the same time, FORE isn't letting go of ATM. The company at the end of March will ship the ASX-1200, an ATM switch that serves as the follow-up to FORE's ASX-1000. The ASX-1200 can set up 4,000 calls per second, 25% more than the ASX-1000. It can support OC-48 (2.5G bit/sec) connections, although those interfaces won't ship until the second half of 1999.

Users can add backplane capacity to the ASX-1200 in 2.5G bit/sec increments, up to 10G bit/sec. Pricing for the slowest model starts at \$28,445.

FORE will also ship a port card for the ASX-4000 that supports lower speeds to make the high-end ATM switch more attractive to enterprises. The card features 16 ports of 155M bit/sec ATM and four at 622M bit/sec. The card costs \$34,995 for the multimode fiber version and \$99,995 for the single-mode fiber version.

But ATM's influence in the enterprise is threatened by Gigabit Ethernet, cautions Mike McConnell, director of enterprise management and LAN programs at Infonetix Research in San Jose. He says the service provider market might still be a better place for FORE to sell its ATM gear.

To that end, FORE recently acquired Euristix, Ltd., a Dublin, Ireland vendor of telecommunications software. Euristix is a 9-year-old company that sells an element management system for service providers. The vendor has developed products to aid in wireless roaming, signal interworking and sending voice over IP.

FORE says the \$81 million acquisition will help it give service providers the ability to guarantee a certain level of service. FORE in the third quarter plans to com-

bine Euristix's management software with its own FOREView network management product.



Building a better backbone

FORE's new ASX-1200 ATM switch has several improvements over the ASX-1000:

- Processes 25% faster.
- Supports 2.5G bit/sec interfaces.
- Has a backplane that extends to 10G bit/sec.

FORE itself continues to be a possible candidate for acquisition by one of the telecom equipment providers, Passmore says. Then again, FORE might not need to be acquired to succeed. "So far, FORE's been able to pursue the go-it-alone strategy quite well," he says. ■



FORE's Gill says a 20G bit/sec switch is on the way.

few years, FORE has introduced Ethernet technologies into its product set.

This broad approach pits FORE more directly against other large equipment vendors, such as Cisco and Nortel Networks.

"FORE still has to work to maintain its differentiation," says David Passmore, research director at NetReference in Sterling, Va. Right now, FORE's primary differentiation is that it recommends ATM first, while other vendors would just as soon sell Layer 3 switching and packet-over-SONET equipment, he says.

Gill says FORE will unveil a 20G bit/sec switch with Ethernet blades, a

Verilink embraces frame relay nets

New devices are smarter than your average DSU/CSU.

BY TIM GREENE

SAN JOSE — Verilink is turning its traditional expertise in dedicated lines toward frame relay with new hardware and software designed to make WAN frame links smarter at a reasonable price.

Already known for its DSU/CSUs, Verilink is introducing a new device called FrameStart that handles typical DSU/CSU functions and features frame relay installation and testing software.

In addition, Verilink is bringing out two new frame relay probes to gather and store data about frame relay permanent virtual circuits: WANscope 240 for 256K bit/sec links and WANscope 250 for T-1 links. To go along with the WANscope products, the company is introducing VeriStats reporting software.

FrameStart is available in two models. See **Verilink**, page 20

Handheld PC taps into back-end applications

BY JOHN COX

EVERETT, WASH. — A specially designed handheld PC, based on the Windows CE operating system, is aimed at an emerging breed of data collection applications.

Intermec Technologies' Intermec 5020 breaks with traditional DOS-based devices by running the 32-bit Windows CE operating system, which supports an array of network options and a graphical user interface. The device is now beginning beta testing.

Intermec's new computer has one card slot, typically for a radio interface, and a CompactFlash slot for additional memory or software. The 5020 in standard mode runs as a batch device connecting to a host, but it can be upgraded via the card slot to

support the Wireless LAN Interoperability Forum's OpenAir specification, which will let the 5020 work with OpenAir-compatible wireless nets. Alternatively, the device can be upgraded to support IEEE 802.11 2.4-GHz radio links to corporate LANs.

The 24-ounce Intermec 5020 can be used to scan bar code data. An Intermec program called Intelligent Data Server reads the data and connects to an Ethernet LAN via a wireless radio link. The program sends the data to the appropriate server application. For example, data about a new shipment



The Intermec 5020 runs Windows CE and can scan bar codes.

of parts will be sent to the inventory server, while data on a user's timecard will be sent to a payroll application.

"This will be a compelling device," says Jill House, an analyst with International Data Corp., a Framingham, Mass., market research company.

"Using Windows CE lowers the cost of these devices,

and they can be pretty easily incorporated into Windows computing environments. The Intermec product offers the ability to incorporate support for back-end systems. That makes possible enterprise-

wide data collection — you can collect data, and it's available for everyone," she says.

Intermec has also created other software programs for the data collection device.

The Remote Unit Manager includes a compact HTTP server as well as an SNMP agent that lets administrators remotely manage the device over a network.

The SNMP support allows administrators to update software applications and run backups, as well as delete and replace corrupted data.

Intermec has more than 200 value-added resellers and integrators that develop applications for specific industries or create interfaces to back-end applications, such as SAP AG's R/3. Intermec competes with Symbol Technologies, among others.

The 5020 will be available in mid-April, with a list price ranging from \$2,000 to \$4,000, depending on whether the customer includes the radio interface and bar code scanner.

Intermec: (800) 347-2636

Verilink,
continued from page 19

one for 56K bit/sec lines and one for T-1 or fractional T-1 lines.

The company says that for the price of a conventional DSU/CSU, FrameStart provides the customer with a DSU/CSU plus software that ensures the frame relay lines are up and confirms Data Link Connection Identifiers and local management interfaces.

FrameStart sits between the corporate router and the frame relay line.

The test software lets customers confirm that the frame relay link will work before it goes live on the router. That ability makes switchovers to a new service smoother and less likely to cause network downtime.

For users who already have DSU/CSUs built in to their routers but want to know more about how well the frame relay connection is working, Verilink is introducing the two WANscopes.

One WANscope beta tester has already used the device to discover a carrier problem with one of his frame relay links.

Data collected by the WANscopes has quantified a prob-

lem on a voice-over-frame relay line in the corporate network of Beiersdorf-Jobst, according to Jim Boudrie, manager of technical data services at the medical products maker.

"It's shown me I have an intermittent problem. I get complaints that the voice over

Use of WANscopes can be enhanced with VeriStats software that generates reports on throughput, bursts over committed information rate and circuit use.

The reports can represent information over time to show trends, as well as determine whether service providers are living up to service-level guarantees.

The software runs on Pentium-powered Windows NT servers.

FrameStart costs \$400 for a 56K bit/sec link and \$800 for a T-1. Those are about the same as the prices of some competitors' DSU/CSUs without diagnostic software.

WANscope 240 costs \$1,995, and WANscope 250 costs \$2,495. VeriStats is priced at about \$5,000 for up to 15 nodes. Pricing for a 10-node network using WANscope 240s, including VeriStats software, is \$25,000.

The same network using WANscope 250s costs \$30,000, the company says.

All of the products are available this month.

Verilink: (408) 945-1199



Verilink's new WANscope probes gather data on frame relay circuits.

frame relay echoes and that there is data delay," he says.

The problem was discovered by recording congestion notifications over time, he says.

Boudrie says the devices also report aggregate bandwidth use over entire T-1 links or use by individual virtual circuits.

Boudrie can see how close his network gets to using the full bandwidth and determine whether he needs to buy more or throttle back some WAN use.

NetManage making host connectivity more manageable

New 14-product ViewNow suite links Windows PCs to Unix, AS/400 and mainframe systems.

BY MARC SONGINI

CUPERTINO, CALIF. — NetManage this week will introduce a line of host access software with built-in end-user support and directory-based management hooks.

The umbrella product line is called eN2000, and the first offering under that umbrella will be a set of 14 products called ViewNow, Windows Edition.

This software will give Windows PC users access to Unix, AS/400 and mainframe systems.

Future eN2000 offerings will give users access to different hosts via thin clients and Web browsers.

ViewNow will let end users access host resources through a Host Access Manager screen on their desktop machines.

The access manager will connect users to emulators that share a common interface regardless of the client platform.

NetManage is providing network administrators with Windows-based tools to set policies defining which resources end users can access. Information about end users,

workgroups and their access rights can be stored in a central Lightweight Directory Access Protocol-compliant directory or in an NT Domain system.

ViewNow will support Microsoft's Active Directory once it is available.

Companies can even use the directory to store information for customers or business partners who need access to host resources.

The management tools will work with all products under the eN2000 product line.

NetManage has also included in its new software technology called SupportNow, which enables net administrators to view and fix problems on end-user desktops across an intranet or the Internet.

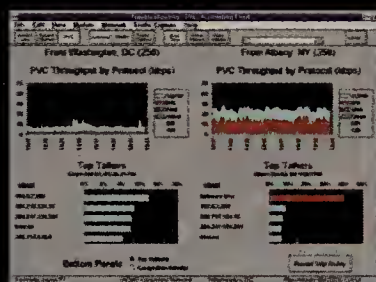
NetManage CEO Zvi Alon says the company took a "holistic" approach to developing eN2000 rather than "trying to glue together a hodgepodge of products that solve different problems."

ViewNow is currently shipping. Pricing per client ranges from \$200 per individual software module to \$500 for the full suite.

NetManage: (408) 973-7171

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IBM pumps up mainframe Web and IP support

BY MARC SONGINI

SOMERS, N.Y. — IBM later this month will begin shipping an upgrade to its OS/390 operating system that beefs up the mainframe's Web capabilities.

OS/390 Version 2.7 allows IBM's S/390 mainframes to handle 11 times as many simultaneous IP sessions and provides faster access to cached Web pages.

The improvements will make it more practical for companies to run Web sites and other applications on their mainframes, rather than running separate Web servers, says Doug Balog, director of software management for IBM S/390s.

Key improvements have been made to OS/390's eNetworks Communications Server component, which can now handle more than 21,000 IP sessions simultaneously.

IBM also has added its Enterprise Extender technology to OS/390, enabling mainframe users to run SNA applications over IP networks and retain quality of service.

IBM also is making it easier to manage IP resources across mainframe environments via a policy agent. The Service Policy Agent defines classes of users and applications, and maintains levels of service for them, limiting bandwidth access to some users and prioritizing the traffic of other users.

Another OS/390 improvement is support for the S/390 Open System Adapter Express, which lets a mainframe handle Gigabit Ethernet traffic.

The latest flavor of OS/390 should please mainframe shop managers who want to take advantage of IP without abandoning their big iron applications, says Freddie Robinson, assistant director of technical operations at the University of Miami in Coral Gables, Fla. Robinson is interested in Version 2.7 for his shop, which uses an S/390 to handle 1,000 to 1,200 Web sessions at any given time. The university's mainframe is used by students for accessing transcript information and other data via the World Wide Web, while also hosting traditional

business applications, such as payroll. Robinson says he likes the idea of

using a mainframe as a Web server rather than running a separate server alongside

the big box. "Users already know how to maintain [the mainframe], back it up and operate it, and can use it for future e-business applications," he says.

The OS/390 upgrade is free to existing 2.X customers.

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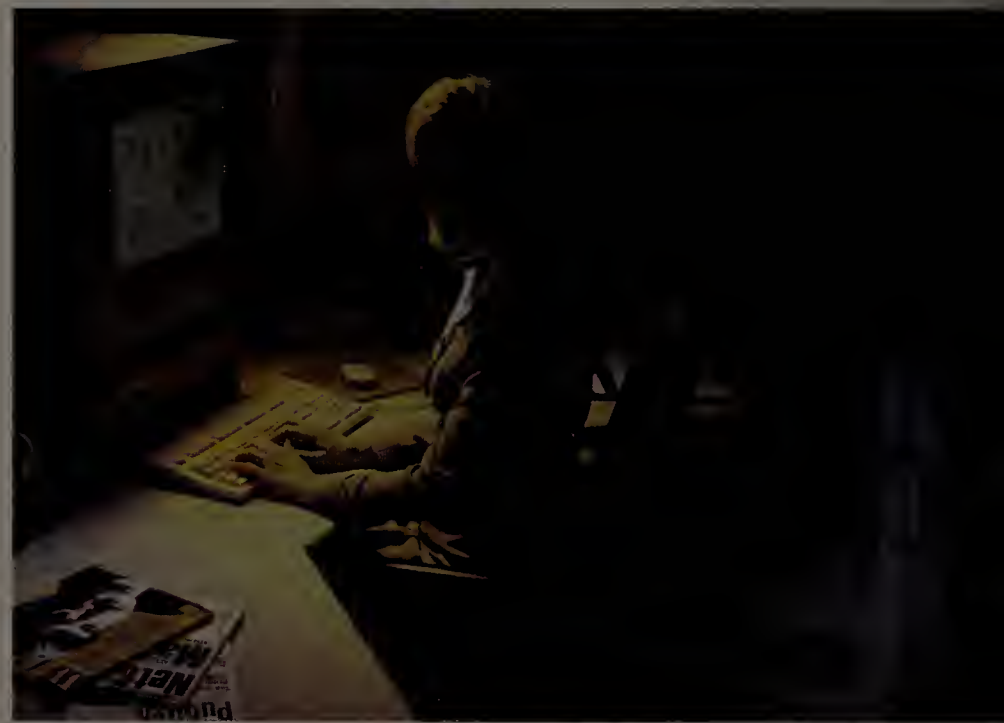


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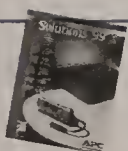
- More details about the new version of OS/390.
- See how some companies are using their mainframes as Web servers.



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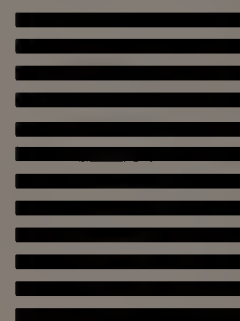
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Internetworking Monitor . Kevin Tolly

LET THE DARK CLOUDS ROLL IN

In a decade of testing, The Tolly Group has run a vast array of tests on countless devices from innumerable vendors. But the test I'd most like to run

for public consumption is one I've never been asked to perform. I call it the Dark Cloud test — a scenario in which test conditions are anything but ideal.

One would think that every vendor claiming to offer enterprise-class or carrier-class products would demand such testing to prove its claims.

Think about it. By definition, a test environment is a controlled one. And virtually every test scenario dreamed up by product people presupposes

complete and total environmental control and represents best-case situations.

Not that there is anything inherently wrong with showing the best case. If a device can't deliver under ideal conditions, we needn't worry about whether it can perform under adverse conditions.

But such best-case testing gives us precious little information about what will happen when the dark clouds roll in. Even the high-stress tests we've run on leading-edge switches, for example, allow vendors to configure those switches with full knowledge of what conditions the devices will encounter. Nevertheless, here we also learn little about what happens when these devices experience unexpected adversity.

Experience has shown that in networking, as elsewhere, devices do not all respond equally well to adverse conditions. Moving from the showroom to the real world changes everything.

So what, specifically, do I want to see in the Dark Cloud test?

First, I'd like to see how a device performs when it is left in its default configuration state. No matter what vendors say, it is my deeply held belief that users leave boxes in as much of a default state as possible (or would like to) more than they care to admit.

Not only would such a test be a fairly reliable indicator of actual behavior, but it would likely serve to embarrass some vendors into selecting good default values for their devices. I doubt a network manager exists who has not repeatedly been dumbfounded by the idiotic choices some vendors make for default values.

After this, I'd want to change the default configuration to de-optimize the box completely. I'd want to configure functions that I won't use and see how that affects performance. You'd be surprised how the invocation of an apparently innocuous feature might cause an awe-inspiring plunge in performance.

Wherever you are given the option to choose how buffers or other internal resources will be used, tune them to be deliberately out of sync with your intended use of the device. Then see how the device performs.

Wouldn't it be great if your attempts to de-optimize a network device failed miserably? Vendors always play up how their enterprise-class and carrier-class technology is smart and robust. Such technology should require little or no manual optimization. Merely by observing and evaluating traffic in real time, such devices should be able to configure resources dynamically for optimal use.

For the truly robust product, sunny days and dark clouds are all the same.

Tolly is president of The Tolly Group, a strategic consulting and independent testing firm in Manasquan, NJ. He can be reached at (732) 528-3300, ktolly@tolly.com or www.tolly.com.

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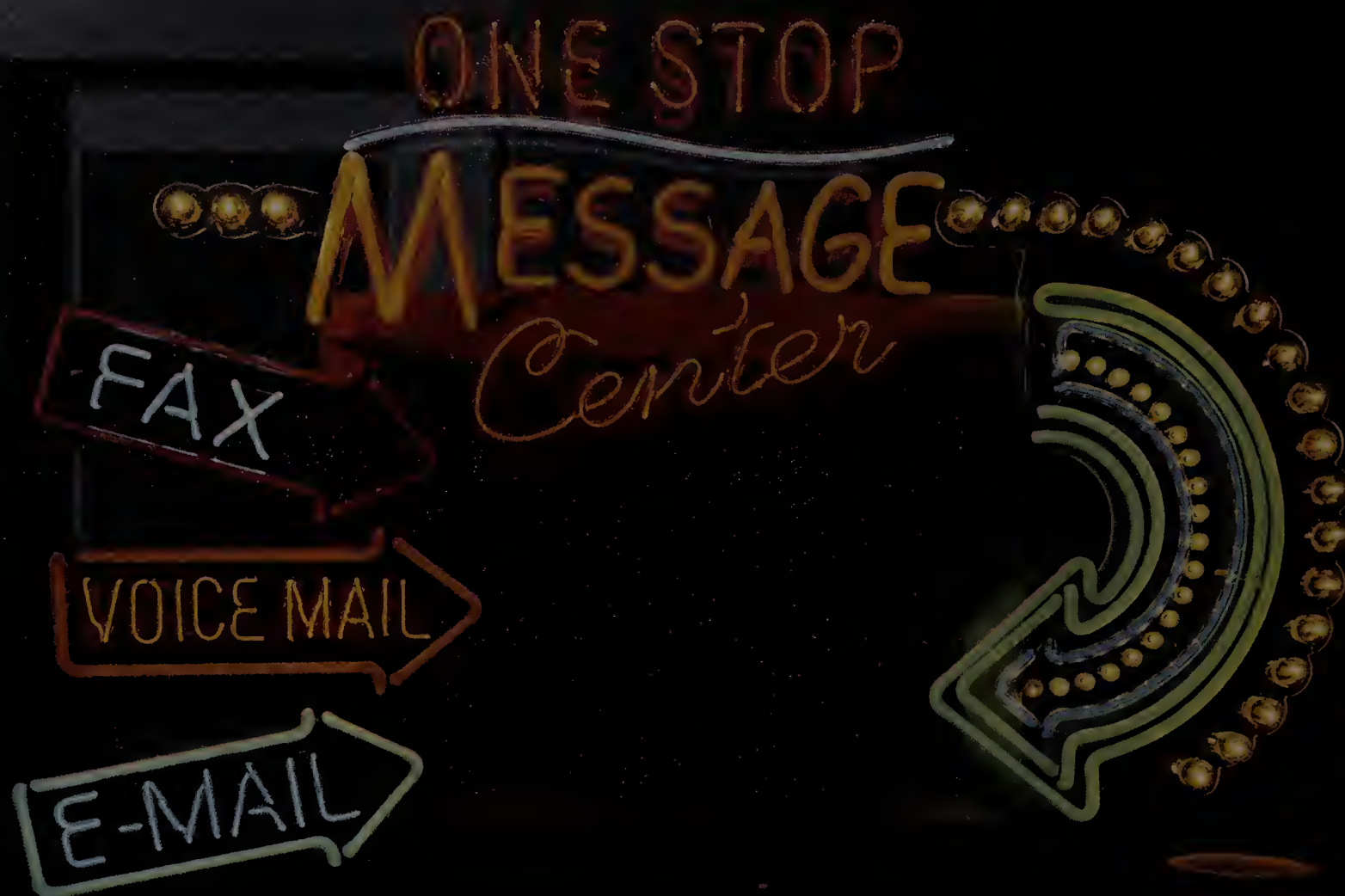
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Carriers & ISPs

**The Internet, Extranets, Interexchange
and Local Carriers, Wireless, Regulatory Affairs**

Briefs

PSINet continued expanding its presence in Europe with last week's acquisition of two French ISPs. PSINet bought **Sateln** and **Planete.net**, both privately held firms, for an undisclosed figure. Both ISPs offer business Internet access services. Planete.net also offers consumer services. These are the third and fourth acquisitions PSINet has made in France and the twelfth and thirteenth the company has made in Europe in the past 18 months.

PSINet: (703) 904-4100

Microsoft has partnered with **Dialogic** to bring voice to its Windows operating system. Microsoft is paying \$20 million to license Dialogic's Computer Telephony Media server software, a fee that also gives Microsoft access to Dialogic's development teams. Microsoft also made a \$24.2 million investment in Dialogic.

ISPs AboveNet Communications and **Rhythms NetConnections** are teaming to provide Internet access via high-speed digital subscriber line (DSL) services. Rhythms currently offers DSL services in seven cities. While Rhythms has already placed gear in AboveNet points of presence, no date has been set for availability of DSL services. Pricing has not been set.

AboveNet: (408) 367-6666;
Rhythms: (303) 476-4201

Altiga Networks and three ISPs are teaming to push broadband virtual private networks (VPN) that use the Internet as a backbone. Qualified customers who buy Altiga VPN Concentrators can get three free cable-modem or DSL connections for three months. **Media One**, **HarvardNet** and **DSCI** are the first ISPs to join Altiga's Built for Broadband initiative.

Altiga: (508) 541-7300

IN-SITE: *Lessons from Leading Users*

American Express: Don't leave home to go to work

BY TIM GREENE

American Express was convinced it had an idea that would save the company money and help retain employees: A virtual office program that would let people work from home.

The problem: Staffing restrictions ruled out the possibility of hiring anyone to set up and run the telecommuting program.

So American Express turned to Telecommute Solutions, a company that sets up soup-to-nuts telecommuting programs, from providing computers to arranging for phone lines to training. The firm even takes care of the furniture.

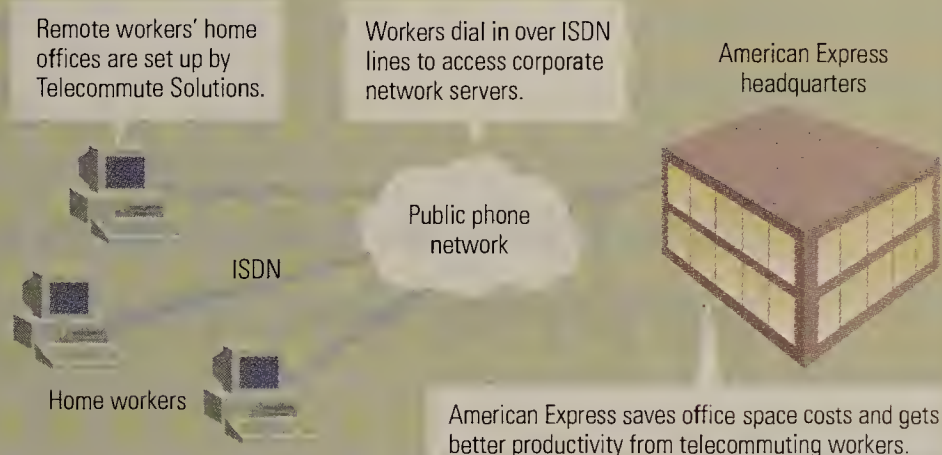
Overriding the project was a strict corporate ban on hiring anyone new to make the program happen. "The thought of adding head count was suicidal. We had to think of how to use existing staff to manage the program," says Joel Ratigan, director of space planning for real estate services. Ratigan liked the plan to have employees work from home because it would cut down on the need to rent space.

After checking out larger vendors Ratigan would not name, American Express decided on Telecommute's TeleWorx service because it seemed that the company could deliver what American Express needed, including:

- Home audits to see if workers'

American Express pushes telecommuting

Telecommute Solutions sets up and runs American Express' Virtual Office program, which lets workers use their homes as offices.



homes are suitable for offices.

- Home-safety checks, looking at factors such as carbon monoxide levels and the availability of fire extinguishers.
- Computer software and hardware setup and training.
- Office furniture selection and delivery.

In addition, Telecommute handles service calls if the American Express help desk determines the user's problem is with hardware or software, Ratigan says.

Ratigan says the savings in real

estate alone make up for what Telecommute charges. Telecommute says its services range from \$150 to \$400 per month per user, depending on how many services it provides.

Home workers dial in over ISDN lines to Shiva LanRover access boxes. Some workers, such as sales people, need to access pricing information and e-mail. Others, such as travel consultants, need to be tied into the company's automated call distribution network.

Telecommute: (770) 831-6630

Go to the Web for ISDN

BY TIM GREENE

Here's some pain reliever for network managers trying to build ISDN networks: A Web site listing information about where the digital dial-up service is available and how much it costs.

The National ISDN Council, made up of the regional Bell operating companies and major ISDN equipment vendors, recently endorsed Telco Express' private Web site as the place to find information about ISDN.

The www.telcoexpress.com site is fed ISDN tariff information by all the RBOCs.

Customers simply enter the area code and three-digit local exchange for the service area in question. The site spits back whether the service is available for that location, what carrier supplies the service and what the service costs per month.

If they want, customers can then order the service online. Telco Express passes along orders to the appropriate service providers. Lookup and order handling are free, says Bryant Dunetz, CEO of Telco Express.

"Without this, we would have to call every phone company across the U.S.," says Rick Reno, purchasing manager for

Comtrak, a security company that supplies its ISDN-based security system to ADT Security Services.

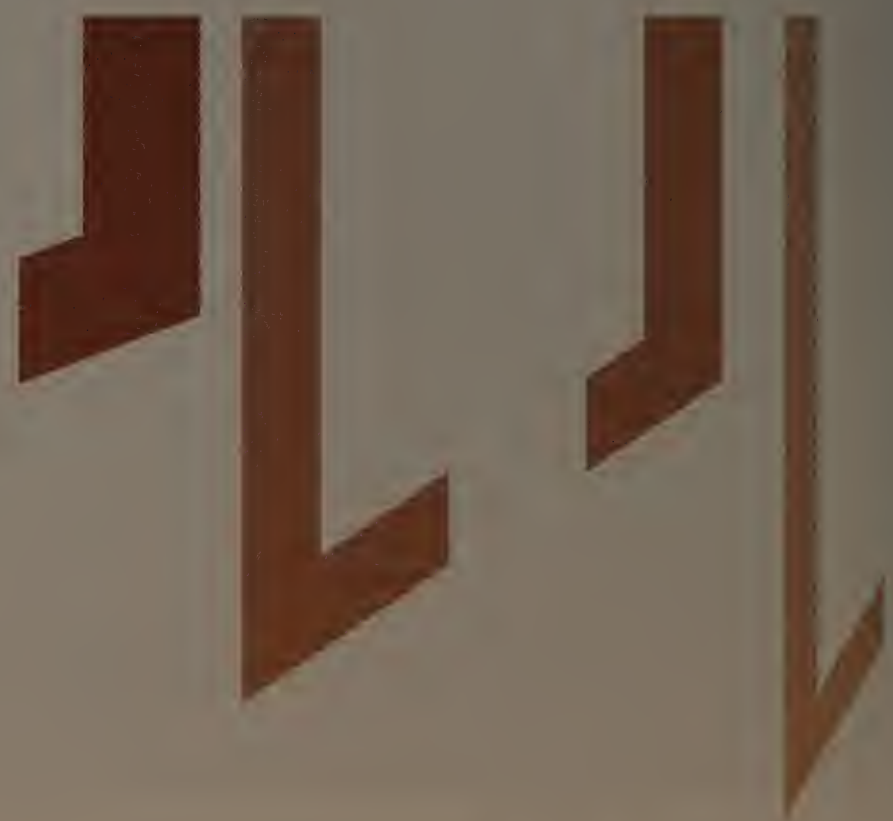
Comtrak is just starting to sell its service to ADT and anticipates having to check frequently for ISDN availability and costs nationwide. Reno says he was considering finding an outside firm to handle the chore for Comtrak but that he now can use the Telco Express site.

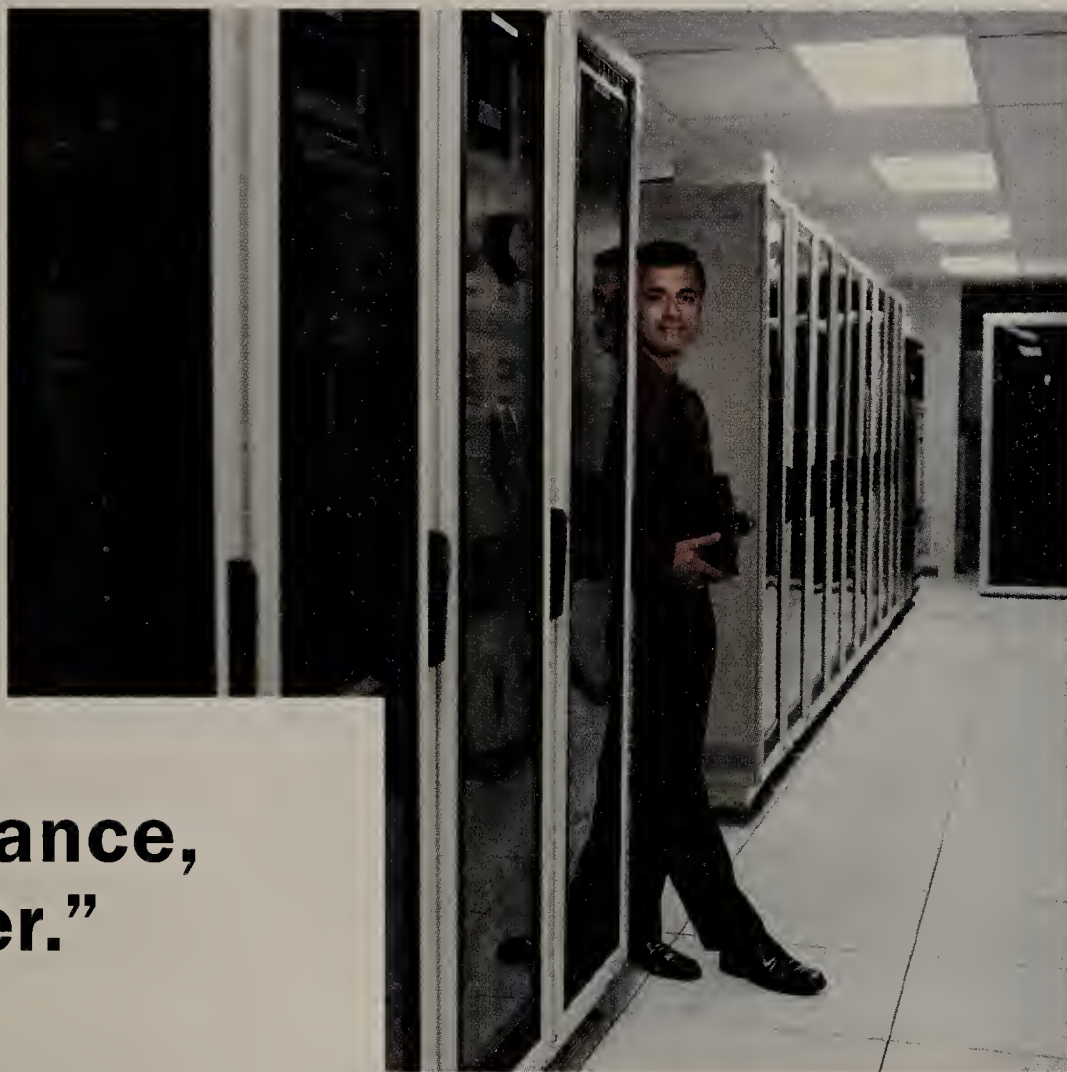
The Telco Express site contains information about other digital services including T-1, T-3 and frame relay. Dunetz says he is considering adding information about digital subscriber line availability and prices. Web browsers can also check the site for competitive local exchange carriers in their areas.

Telco Express: (877) 988-6484



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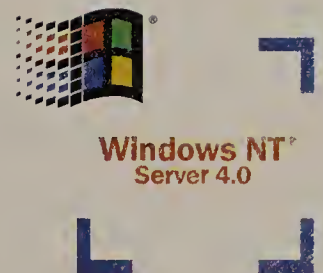




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Jerry Gross, CIO
Countrywide Home Loans, Inc.



www.microsoft.com/go/CaseStudy/Performance

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Eye on the carriers . David Rohde

SATELLITE SALES LEADS GO BEGGING

Here's the good news for global satellite telephony vendor Iridium: There sure are a lot of people interested in your product.

Now guess how many of the dozens of people who wrote to me could get their hands on one of your phones?

In my last column, I reported my tra-

vails in trying to sign up for Iridium's service, which supposedly lets you use a handset to make calls from anywhere in the world by bouncing signals off of a

network of 66 low-earth orbit satellites.

I suggested Iridium was letting sales leads go down the drain because the company couldn't bring itself to tell prospects that its phone costs nearly \$3,800 and airtime is \$2 to \$7 per minute. That's the way it seems to *Network World* readers who have been baited by Iridium's ads, which focus more on flora and fauna in remote areas of the world than on subscription plans.

"I was tentatively interested in an Iridium phone last month and never could find anyone to talk to," says one reader. "At least you got prices! Wow! I'll bet their losses continue to mount with rates like that."

Another: "I filled out the information form on the Web site, and I haven't heard from anyone, virtual or real. I would have thought that with such high losses they would be very interested in customers, but it does not seem to be the case. It also seems quite interesting that after reading every advertisement and most of their considerable Web site that pricing is not to be found."

Here's the response of one particularly diligent user: "I tried all seven of the official North American distributors. I left messages for four of them. One of them actually answered, told me they'd send some literature, and the other three had no answer. I gave up after that. How much effort are we supposed to put into spending thousands of dollars on a phone?"

One reader went to a Sprint PCS store in Kansas City and was told it would be another few months before it was ready to sell Iridium service. Sprint, by the way, is one of three principal investors in Iridium North America, after Motorola and Bell Canada's wireless division.

Karla Williams, Iridium's director of marketing and communications, says the company recognizes its Web site deficiencies and is working to fix them. She also says the company's price-point strategy is to de-emphasize Iridium as an alternative to cellular and to try to get people to compare it to the cost of calling a foreign country over phone lines — without the mobility and flexibility.

That's fine, if prospects ever get that far. It sounds like Iridium distributors are actually afraid of bringing up the price. It might be better if Iridium's home page said, "Look, here's the deal — it costs X and if you have sticker shock, no hard feelings. But we've got to sell some of this stuff to get our stock price back to \$70 (it's now at around \$25)."

Well, I do have one advantage — the power of the press has landed me an Iridium demo next week by a Baltimore-area representative. We'll see how that goes. And oh, if someone out there does have Iridium service, could you drop me a line? I want to know how it's going.

Robde is a senior editor with Network World. He can be reached at drobde@nw.com.

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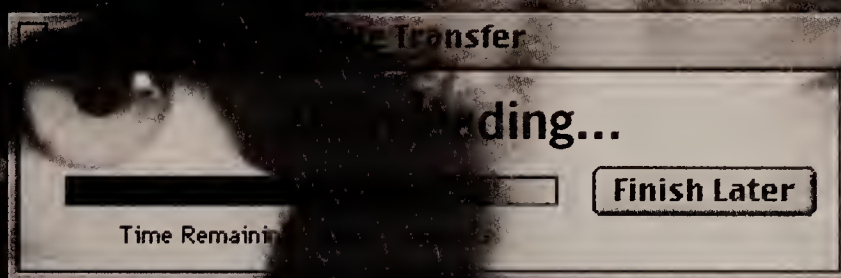
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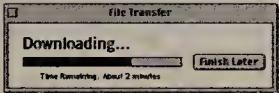
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BANDWIDTH MANAGEMENT

Getting the most for your Internet dollar

BY DENISE PAPPALARDO

If you are charged with deploying bandwidth-hungry Internet applications, the pressure is on to deliver high-quality service while keeping network expenses to a minimum.

You could simply keep increasing the size of your companies' Internet access pipes to keep up with bandwidth demands, but not if your goal is to keep costs down. Bandwidth, after all, isn't cheap.

MCI WorldCom's UUNET division, for example, charges \$1,295 per month for a burstable T-1 service if you average 128K bit/sec of usage. If you average between 384K and 512K bit/sec of usage, the charge jumps to \$2,750 per month. These are list prices, and you can expect 5% to 15% discounts if you sign one- to three-year contracts, but total circuit costs still add up fast.

The alternative, of course, is to better manage the pipes you already have. With the onslaught of new bandwidth management products in the past six to 12 months, business users have more choices than ever to choose from.

Packeteer and Xedia were some of the first vendors to introduce bandwidth management devices. But now users have other choices, including products from Allot Communications, NetReality and Elron Software, to name a few.

Basically, these products let you dedicate portions of your Internet access trunks to certain types of traffic, specific IP addresses or URLs. The ability to divide bandwidth lets you deploy applications such as SAP over IP-based virtual private networks (VPN) because you can dedicate capacity to SAP traffic at the expense of traffic coming from, for example, ESPN's home page.

Northwest Missouri State University started looking at bandwidth management products because it wanted the ability to ensure that business applications have the bandwidth they need, says Jonathan Sloop, a client/server technician at the Maryville, Mo., college. The university next semester plans to add four Web-based courses to its curriculum.

The school has been testing Elron's Bandwidth Optimizer NT-based management system to guarantee the network will have enough bandwidth to support students that sign up for Web-based classes. The product could also help keep Internet games from hogging the network when classes aren't in session, Sloop says.

Products such as Bandwidth Optimizer typically

Bandwidth management devices make it possible to maintain high-quality service while staving off costly network upgrades.

For example, Diff-Serv lets you mark all Citrix, SAP or voice traffic as first-class traffic. This traffic always flows to the queue you have indicated as the highest priority queue — most likely the queue with the largest amount of bandwidth.

When one queue becomes full, AccessPoint either drops those packets and resends them when the congestion has subsided, or you can set up the device to bump second- and third-class traffic before dropping any first-class traffic.

Packeteer in Santa Clara, Calif., on the other hand, has been using TCP rate control to let customers guarantee bandwidth on IP networks. TCP rate control lets you assign transmission rates for each traffic class you define. Without resorting to queues that some say cause network latency, Packeteer's PacketShaper 2000 lets you set policies that are primarily based on traffic type but can also take into account IP addresses and URLs.

Products from some vendors, such as Allot, NetReality and Amplify.net, combine queuing and TCP rate control with unique twists. NetReality's WiseWan Enterprise device and network managed software use adaptive fair weighted queuing. While similar to CBQ, adaptive fair weighted queuing deals with overloaded queues differently. An end user on a WiseWan network will be notified if his traffic is being stored because his given queue is overloaded. Other queuing technology doesn't provide such end-user notification.

Amplify.net is combining its CBQ implementation with a SQL database. The company's iSurferRanger.ec bandwidth management device doesn't process policy information like competitors' products. Instead, iSurferRanger.ec consults a SQL database for directions on dealing with a particular user's traffic. Amplify.net claims moving the processing job to a database server speeds up policy enforcement on an IP network.

Each bandwidth management vendor can tout a unique plus, but the trend is pushing the industry away from interoperability. Standards organizations are trying to address this problem.

The IETF has several bandwidth management specifications in the works, such as Resource Reservation Protocol, Multi-protocol Label Switching and Diff-Serv. But the industry isn't ready to fully adopt these protocols as the best and only ways to address bandwidth management or quality of service over an IP backbone.

So you have options, but pick and choose carefully, because you may be stuck with a single-vendor solution for longer than you might like. ■

Bandyng about bandwidth management products

Users have more choices of bandwidth management products than ever. Here are some that support 1.54M to 10M bit/sec Internet access and one or two 10/100 Ethernet ports.

Vendor	Product	Features	Price
Allot Communications	AC200	TCP rate control and queuing	\$6,995
Amplify.net	iSurferRanger.ec	CBQ, bundled with an Oracle 8.0 or Microsoft SQL database	\$7,995
Elron Software	Bandwidth Optimizer	NT software product; TCP rate control and queuing	\$3,995*
NetReality	WiseWan Enterprise	Adaptive fair weighted queuing	\$2,990
Packeteer	PacketShaper 2000	TCP rate control	\$7,250
Xedia	AccessPoint	CBQ, Diff Serv	\$8,995

*For a 25 user license

sit directly behind an access router and police incoming and outgoing Internet traffic based on policies that a network manager sets up. But to ensure Citrix traffic on a VPN gets 128K bit/sec worth of bandwidth, for example, you would have to deploy a management device at every endpoint.

While the premise behind bandwidth management devices is the same, they have some proprietary technology that essentially makes it impossible for you to deploy multiple vendor's devices.

For example, Littleton, Mass.-based Xedia's AccessPoint bandwidth management devices support class-based queuing (CBQ) and the Internet Engineering Task Force's pending Differentiated Services (Diff-Serv) specification. Queuing lets you set priorities or establish different classes of service on your network. Using Xedia's management tool, which is SNMP-based, you can carve your connection to the Internet into three different service classes.

Diff-Serv then allows you to tag certain types of traffic based on a predefined queuing class system.

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TO QUALIFY: You must supply your company name and address. If military, please specify branch/base. If government, please specify division.

Name _____ Title _____

Company _____

Division/Mail Stop/Military Branch or Base _____

Street Address _____

City _____ State _____ Zip _____

If there is a parent company, please provide name: _____

☐ My home address is also my business address.

Optional delivery address: Enter your home address below if your company will not accept delivery at your business address:

Street Address _____ City _____ State _____ Zip _____

Business phone (_____) _____ FAX (_____) _____

Internet E-mail address _____

Would you like to receive our weekly e-mail news update "InFusion"? ☐ Yes ☐ No

Would you like to receive periodic information via e-mail on 3rd party networking products/services? ☐ Yes ☐ No

Publisher reserves the right to serve only those individuals who meet publication qualifications.

ALL questions must be answered. Incomplete forms will not be processed. Free subscriptions available to qualified US applicants. Foreign and Canadian rates available upon request.

B399

1. What is the principal business activity at your location?

(check ONE only)

- | | | |
|---|---|--|
| 01. <input type="checkbox"/> Manufacturing (other) | 10. <input type="checkbox"/> Education | 18. <input type="checkbox"/> Manufacturing (Computer/Communications/OEM) |
| 02. <input type="checkbox"/> Finance/Banking | 11. <input type="checkbox"/> Process Industries (Mining/Construction/Petroleum Refining/Agriculture/Forestry) | 19. <input type="checkbox"/> Resellers of Computer/Network Products (VARs, VADs) |
| 03. <input type="checkbox"/> Insurance/Real Estate/Legal | 12. <input type="checkbox"/> Government (Federal/State/Local) | 20. <input type="checkbox"/> Systems/Network Integrators* |
| 04. <input type="checkbox"/> Health Care Services | 13. <input type="checkbox"/> Military | 21. <input type="checkbox"/> Distributors (Computer/Communications)* |
| 05. <input type="checkbox"/> Hospitality/Entertainment/Recreation | 14. <input type="checkbox"/> Aerospace | 22. <input type="checkbox"/> Other (please specify) _____ |
| 06. <input type="checkbox"/> Media/TV/Cable /Radio/Print | 15. <input type="checkbox"/> Consulting (Independent)* | |
| 07. <input type="checkbox"/> Retail/Wholesale Trade/Business Services | 16. <input type="checkbox"/> Carriers/Interconnects | |
| 08. <input type="checkbox"/> Transportation | 17. <input type="checkbox"/> Internet Service Provider (ISP) | |
| 09. <input type="checkbox"/> Utilities | | |

* Please complete form based on largest client.

2. What is your job function?

(check ONE only)

- | | | |
|--|--|---|
| NETWORK IS MANAGEMENT: | 4. <input type="checkbox"/> IS/IT/MIS/CIO/Systems Management | 7. <input type="checkbox"/> Corporate Management (CEO, Pres., VP, Dir., Mgr., Financial Management) |
| 1. <input type="checkbox"/> Network Management | 5. <input type="checkbox"/> Internet/Intranet/Electronic Commerce Mgmt., Webmaster | 8. <input type="checkbox"/> Consultant (Independent) |
| 2. <input type="checkbox"/> LAN Management | 6. <input type="checkbox"/> Engineering Management | 9. <input type="checkbox"/> Other _____ |
| 3. <input type="checkbox"/> Datacom/Telecom Management | | |

3. What is the estimated value of Network equipment and services that you specify, recommend or approve the purchase of? (Please print the appropriate number code on the line next to each product category. Please complete ALL categories A-N.)

- | | | |
|-----------------------------------|---|--------------------------|
| 1. \$100 Million or more | A. _____ Large Systems (Mainframes/Minis) | G. _____ Internetworking |
| 2. \$50 Million to \$99.9 Million | | H. _____ Internet |
| 3. \$25 Million to \$49.9 Million | B. _____ Desktops (Micros/Laptops/Workstations) | I. _____ Intranet |
| 4. \$10 to \$24.9 Million | | J. _____ Extranet |
| 5. \$1 to \$9.9 Million | C. _____ Servers | K. _____ Remote Access |
| 6. \$100,000 to \$999,999 | D. _____ LANs | L. _____ Peripherals |
| 7. \$50,000 to \$99,999 | E. _____ WAN Equipment | M. _____ Software |
| 8. Under \$50,000 | F. _____ Carrier Services | N. _____ Service/Support |
| 9. None of the above | | |

4. What is the total number of sites for which you have purchase influence?

(check ONE only)

1. ☐ 100+ 2. ☐ 50 - 99 3. ☐ 20 - 49 4. ☐ 10 - 19 5. ☐ 2 - 9 6. ☐ 1 7. ☐ None

5. What is the total number of Servers/Clients/LANs installed/planned at your location/ in your entire organization? (check ONE box in each column)

SERVERS		CLIENTS		LANs	
At Location	Entire Org.	At Location	Entire Org.	At Location	Entire Org.
A	B	C	D	E	F
<input type="checkbox"/> 1. 50,000+	<input type="checkbox"/>	<input type="checkbox"/> 1. 50,000+	<input type="checkbox"/>	<input type="checkbox"/> 1. 50,000+	<input type="checkbox"/>
<input type="checkbox"/> 2. 10,000 to 49,999	<input type="checkbox"/>	<input type="checkbox"/> 2. 10,000 to 49,999	<input type="checkbox"/>	<input type="checkbox"/> 2. 10,000 to 49,999	<input type="checkbox"/>
<input type="checkbox"/> 3. 1,000 to 9,999	<input type="checkbox"/>	<input type="checkbox"/> 3. 1,000 to 9,999	<input type="checkbox"/>	<input type="checkbox"/> 3. 1,000 to 9,999	<input type="checkbox"/>
<input type="checkbox"/> 4. 100 to 999	<input type="checkbox"/>	<input type="checkbox"/> 4. 100 to 999	<input type="checkbox"/>	<input type="checkbox"/> 4. 100 to 999	<input type="checkbox"/>
<input type="checkbox"/> 5. 50 to 99	<input type="checkbox"/>	<input type="checkbox"/> 5. 50 to 99	<input type="checkbox"/>	<input type="checkbox"/> 5. 50 to 99	<input type="checkbox"/>
<input type="checkbox"/> 6. 10 to 49	<input type="checkbox"/>	<input type="checkbox"/> 6. 10 to 49	<input type="checkbox"/>	<input type="checkbox"/> 6. 10 to 49	<input type="checkbox"/>
<input type="checkbox"/> 7. 1 to 9	<input type="checkbox"/>	<input type="checkbox"/> 7. 1 to 9	<input type="checkbox"/>	<input type="checkbox"/> 7. 1 to 9	<input type="checkbox"/>
<input type="checkbox"/> 8. none	<input type="checkbox"/>	<input type="checkbox"/> 8. none	<input type="checkbox"/>	<input type="checkbox"/> 8. none	<input type="checkbox"/>

6. What is your scope and involvement in purchasing decisions for network products and services for your enterprise?

A. Scope (check one only)

1. ☐ Corporate/Enterprise
2. ☐ Department
3. ☐ None

B. Involvement (check ALL that apply)

1. ☐ Create Network Strategy
2. ☐ Recommend/Specify
3. ☐ Approve

4. ☐ Evaluate
5. ☐ Determine the Need
6. ☐ None

7. What is the estimated number of employees at your location/in entire organization?

(check ONE in each section)

- | | | | |
|---|---|---|---|
| A. At your location: | | B. Entire organization: | |
| 1. <input type="checkbox"/> Over 20,000 | 5. <input type="checkbox"/> 1,000 - 2,499 | 1. <input type="checkbox"/> Over 20,000 | 5. <input type="checkbox"/> 1,000 - 2,499 |
| 2. <input type="checkbox"/> 10,000 - 19,999 | 6. <input type="checkbox"/> 500 - 999 | 2. <input type="checkbox"/> 10,000 - 19,999 | 6. <input type="checkbox"/> 500 - 999 |
| 3. <input type="checkbox"/> 5,000 - 9,999 | 7. <input type="checkbox"/> 250 - 499 | 3. <input type="checkbox"/> 5,000 - 9,999 | 7. <input type="checkbox"/> 499 or less |
| 4. <input type="checkbox"/> 2,500 - 4,999 | 8. <input type="checkbox"/> 249 or less | 4. <input type="checkbox"/> 2,500 - 4,999 | |

8. Please indicate the products/services that you are currently involved in purchasing or plan to purchase: (check ALL that apply)

A. Currently involved in purchasing

B. Plan to purchase

INTERNET/INTRANET

- | | | |
|--|---|---|
| <input type="checkbox"/> 01. <input type="checkbox"/> Internet Services/Web Hosting | <input type="checkbox"/> 07. <input type="checkbox"/> Voice/Video Over IP | <input type="checkbox"/> 12. <input type="checkbox"/> Web Browsers |
| <input type="checkbox"/> 02. <input type="checkbox"/> Firewalls/Security/Encryption | <input type="checkbox"/> 08. <input type="checkbox"/> VPN Equipment/Services | <input type="checkbox"/> 13. <input type="checkbox"/> Intranet Applications/Groupware |
| <input type="checkbox"/> 03. <input type="checkbox"/> Web Servers/Software | <input type="checkbox"/> 09. <input type="checkbox"/> Legacy Integration Tools (Web to Host) | <input type="checkbox"/> 14. <input type="checkbox"/> Search/Retrieval Products (web crawler) |
| <input type="checkbox"/> 04. <input type="checkbox"/> Web Servers/Hardware | <input type="checkbox"/> 10. <input type="checkbox"/> Web Development Tools (JAVA, ActiveX, etc.) | <input type="checkbox"/> 15. <input type="checkbox"/> Electronic Commerce Tools |
| <input type="checkbox"/> 05. <input type="checkbox"/> TCP/IP Software | <input type="checkbox"/> 11. <input type="checkbox"/> Push Technology | <input type="checkbox"/> 16. <input type="checkbox"/> Web Authoring Tools |
| <input type="checkbox"/> 06. <input type="checkbox"/> Management/Monitoring Software | | <input type="checkbox"/> 17. <input type="checkbox"/> Other _____ |

LOCAL-AREA NETWORKS/ INTERNETWORKING

- | | | |
|---|--|--|
| <input type="checkbox"/> 18. <input type="checkbox"/> Local-Area Networks | <input type="checkbox"/> 28. <input type="checkbox"/> Layer 3 Switches | <input type="checkbox"/> 37. <input type="checkbox"/> UPS |
| <input type="checkbox"/> 19. <input type="checkbox"/> Network Operating System Software | <input type="checkbox"/> 29. <input type="checkbox"/> Network Storage Devices (NASs, SANs) | <input type="checkbox"/> 38. <input type="checkbox"/> Network Interface Cards (NICs) |
| <input type="checkbox"/> 20. <input type="checkbox"/> Servers | <input type="checkbox"/> 30. <input type="checkbox"/> LAN Storage/Backup | <input type="checkbox"/> 39. <input type="checkbox"/> Hubs |
| <input type="checkbox"/> 21. <input type="checkbox"/> Print Servers | <input type="checkbox"/> 31. <input type="checkbox"/> Optical Storage/Backup/Jukeboxes | <input type="checkbox"/> 40. <input type="checkbox"/> Intelligent Hubs |
| <input type="checkbox"/> 22. <input type="checkbox"/> Routers | <input type="checkbox"/> 32. <input type="checkbox"/> Disk Storage/Backup | <input type="checkbox"/> 41. <input type="checkbox"/> Stackable Hubs |
| <input type="checkbox"/> 23. <input type="checkbox"/> ATM Switches | <input type="checkbox"/> 33. <input type="checkbox"/> Tape Storage/Backup | <input type="checkbox"/> 42. <input type="checkbox"/> Bridge/Router |
| <input type="checkbox"/> 24. <input type="checkbox"/> Token-Ring Switches | <input type="checkbox"/> 34. <input type="checkbox"/> RAID Storage/Backup | <input type="checkbox"/> 43. <input type="checkbox"/> SNMP Network Management |
| <input type="checkbox"/> 25. <input type="checkbox"/> Ethernet Switches | <input type="checkbox"/> 35. <input type="checkbox"/> Network Test/Diagnostic Tools | <input type="checkbox"/> 44. <input type="checkbox"/> Gateways |
| <input type="checkbox"/> 26. <input type="checkbox"/> Fast Ethernet | <input type="checkbox"/> 36. <input type="checkbox"/> Cables, Connectors, Baluns | <input type="checkbox"/> 45. <input type="checkbox"/> Concentrators/Repeaters |
| <input type="checkbox"/> 27. <input type="checkbox"/> Gigabit Ethernet | | <input type="checkbox"/> 46. <input type="checkbox"/> Other (please specify) _____ |

COMPUTERS/PERIPHERALS

- | | | |
|--|---|---|
| <input type="checkbox"/> 47. <input type="checkbox"/> Thin Clients/Network Computers (NCs) | <input type="checkbox"/> 50. <input type="checkbox"/> Minis | <input type="checkbox"/> 54. <input type="checkbox"/> CD-R/DVD |
| <input type="checkbox"/> 48. <input type="checkbox"/> Laptops/Notebooks/Sub-Notebooks | <input type="checkbox"/> 51. <input type="checkbox"/> Mainframes | <input type="checkbox"/> 55. <input type="checkbox"/> Fax/Modem Boards |
| <input type="checkbox"/> 49. <input type="checkbox"/> Micros/PCs | <input type="checkbox"/> 52. <input type="checkbox"/> Workstations | <input type="checkbox"/> 56. <input type="checkbox"/> Memory/Chips/Boards/Cards |
| | <input type="checkbox"/> 53. <input type="checkbox"/> Printers/Network Printers | <input type="checkbox"/> 57. <input type="checkbox"/> Other _____ |

REMOTE/WIRELESS COMPUTING

- | | | |
|--|--|---|
| <input type="checkbox"/> 58. <input type="checkbox"/> Remote Access Products | <input type="checkbox"/> 61. <input type="checkbox"/> PCMCIA Devices | <input type="checkbox"/> 63. <input type="checkbox"/> Cellular Equipment & Services |
| <input type="checkbox"/> 59. <input type="checkbox"/> Remote Access Services | <input type="checkbox"/> 62. <input type="checkbox"/> Wireless Data Equipment/Services | <input type="checkbox"/> 64. <input type="checkbox"/> Other (please specify) _____ |
| <input type="checkbox"/> 60. <input type="checkbox"/> PDAs | | |

SOFTWARE/APPLICATIONS

- | | | |
|--|--|--|
| <input type="checkbox"/> 65. <input type="checkbox"/> Network Management | <input type="checkbox"/> 75. <input type="checkbox"/> EDI | <input type="checkbox"/> 84. <input type="checkbox"/> Data Warehousing |
| <input type="checkbox"/> 66. <input type="checkbox"/> Systems Management | <input type="checkbox"/> 76. <input type="checkbox"/> E-mail | <input type="checkbox"/> 85. <input type="checkbox"/> Anti Virus Software |
| <input type="checkbox"/> 67. <input type="checkbox"/> Security | <input type="checkbox"/> 77. <input type="checkbox"/> Desktop Videoconferencing | <input type="checkbox"/> 86. <input type="checkbox"/> Multimedia |
| <input type="checkbox"/> 68. <input type="checkbox"/> Communications Software | <input type="checkbox"/> 78. <input type="checkbox"/> Imaging | <input type="checkbox"/> 87. <input type="checkbox"/> Yr. 2000 Conversion Software (Y2K) |
| <input type="checkbox"/> 69. <input type="checkbox"/> Terminal Emulation | <input type="checkbox"/> 79. <input type="checkbox"/> Suites/Server Suites (Back Office, etc.) | <input type="checkbox"/> 88. <input type="checkbox"/> Helpdesk |
| <input type="checkbox"/> 70. <input type="checkbox"/> Operating Systems | <input type="checkbox"/> 80. <input type="checkbox"/> Middleware | <input type="checkbox"/> 89. <input type="checkbox"/> Web Based Management Tools |
| <input type="checkbox"/> 71. <input type="checkbox"/> Applications Development Tools | <input type="checkbox"/> 81. <input type="checkbox"/> Document Management | <input type="checkbox"/> 90. <input type="checkbox"/> Directory Services |
| <input type="checkbox"/> 72. <input type="checkbox"/> Database Management/ RDBMS | <input type="checkbox"/> 82. <input type="checkbox"/> Site Metering Tools | <input type="checkbox"/> 91. <input type="checkbox"/> Other (please specify) _____ |
| <input type="checkbox"/> 73. <input type="checkbox"/> Groupware | <input type="checkbox"/> 83. <input type="checkbox"/> Computer Telephony Integration (CTI) | |
| <input type="checkbox"/> 74. <input type="checkbox"/> Workflow | | |

WIDE-AREA NETWORK EQUIPMENT & SERVICES

- | | | |
|--|---|---|
| <input type="checkbox"/> 92. <input type="checkbox"/> 56 Kbps Modems | <input type="checkbox"/> 99. <input type="checkbox"/> xDSL Services/Products | <input type="checkbox"/> 108. <input type="checkbox"/> Managed LAN/Router Services |
| <input type="checkbox"/> 93. <input type="checkbox"/> Under 56 Kbps Modems | <input type="checkbox"/> 100. <input type="checkbox"/> Diagnostic/Test Equipment | <input type="checkbox"/> 109. <input type="checkbox"/> Other _____ |
| <input type="checkbox"/> 94. <input type="checkbox"/> Cable Modems | <input type="checkbox"/> 101. <input type="checkbox"/> DSU/CSU | |
| <input type="checkbox"/> 95. <input type="checkbox"/> Asynchronous Transfer Mode (ATM) | <input type="checkbox"/> 102. <input type="checkbox"/> PBXs | <input type="checkbox"/> 110. <input type="checkbox"/> Outsourcing/Systems Integration Services |
| <input type="checkbox"/> 96. <input type="checkbox"/> Frame Relay Equipment/Services | <input type="checkbox"/> 103. <input type="checkbox"/> Videoconferencing | <input type="checkbox"/> 111. <input type="checkbox"/> Education/Training Services |
| <input type="checkbox"/> 97. <input type="checkbox"/> ISDN Equipment & Services | <input type="checkbox"/> 104. <input type="checkbox"/> Leased Lines | |
| <input type="checkbox"/> 98. <input type="checkbox"/> FT-1/T-1/T-3 Multiplexers/Services | <input type="checkbox"/> 105. <input type="checkbox"/> Switched Data | <input type="checkbox"/> 112. <input type="checkbox"/> None of the above (1-111) |
| | <input type="checkbox"/> 106. <input type="checkbox"/> Virtual Private Networks (VPN) | |
| | <input type="checkbox"/> 107. <input type="checkbox"/> FRADs | |

9. Please indicate the platforms that are currently installed/planned: (check ALL that apply)

A. Currently installed

B. Planned for purchase

NETWORK PROTOCOLS

- | | | |
|--|--|---|
| <input type="checkbox"/> 01. <input type="checkbox"/> TCP/IP | <input type="checkbox"/> 04. <input type="checkbox"/> Novell IPX/SPX | <input type="checkbox"/> 07. <input type="checkbox"/> NFS |
| <input type="checkbox"/> 02. <input type="checkbox"/> IPv6 | <input type="checkbox"/> 05. <input type="checkbox"/> APPC/APPN/LU 6.2 | <input type="checkbox"/> 08. <input type="checkbox"/> SNMP |
| <input type="checkbox"/> 03. <input type="checkbox"/> SNA | <input type="checkbox"/> 06. <input type="checkbox"/> NETBIDS | <input type="checkbox"/> 09. <input type="checkbox"/> Other _____ |

LAN ENVIRONMENT

- | | | |
|--|---|---|
| <input type="checkbox"/> 10. <input type="checkbox"/> Gigabit Ethernet | <input type="checkbox"/> 14. <input type="checkbox"/> ATM | <input type="checkbox"/> 18. <input type="checkbox"/> FDDI |
| <input type="checkbox"/> 11. <input type="checkbox"/> Switched Ethernet | <input type="checkbox"/> 15. <input type="checkbox"/> Token Ring/Token Ring Switching | <input type="checkbox"/> 19. <input type="checkbox"/> 100Base-T |
| <input type="checkbox"/> 12. <input type="checkbox"/> Fast Ethernet (100 Megabit Ethernet) | <input type="checkbox"/> 16. <input type="checkbox"/> IP Switching | <input type="checkbox"/> 20. <input type="checkbox"/> 10Base-T |
| <input type="checkbox"/> 13. <input type="checkbox"/> Ethernet | <input type="checkbox"/> 17. <input type="checkbox"/> Layer 3 Switching | <input type="checkbox"/> 21. <input type="checkbox"/> Fibre Channel |
| | | <input type="checkbox"/> 22. <input type="checkbox"/> Other _____ |

NETWORK OPERATING SYSTEM

- | | | |
|--|---|--|
| <input type="checkbox"/> 23. <input type="checkbox"/> Windows NT | <input type="checkbox"/> 27. <input type="checkbox"/> Novell (NetWare 4.X) | <input type="checkbox"/> 31. <input type="checkbox"/> IBM (Server) |
| <input type="checkbox"/> 24. <input type="checkbox"/> Windows NT/Advanced Server | <input type="checkbox"/> 28. <input type="checkbox"/> Novell (NetWare 2.X, 3.X) | <input type="checkbox"/> 32. <input type="checkbox"/> Other (please specify) _____ |
| <input type="checkbox"/> 25. <input type="checkbox"/> Novell IntranetWare | <input type="checkbox"/> 29. <input type="checkbox"/> Microsoft (LAN Manager) | |
| <input type="checkbox"/> 26. <input type="checkbox"/> Novell (NetWare 5.X) | <input type="checkbox"/> 30. <input type="checkbox"/> Banyan (VINES) | |

COMPUTER OPERATING SYSTEM

- | | | |
|--|---|--|
| <input type="checkbox"/> 33. <input type="checkbox"/> NT Server | <input type="checkbox"/> 38. <input type="checkbox"/> Windows 95 | <input type="checkbox"/> 43. <input type="checkbox"/> Digital VMS |
| <input type="checkbox"/> 34. <input type="checkbox"/> NT Workstation | <input type="checkbox"/> 39. <input type="checkbox"/> Windows 98, .9x | <input type="checkbox"/> 44. <input type="checkbox"/> Macintosh |
| <input type="checkbox"/> 35. <input type="checkbox"/> Unix/Xenix/AIX/SCO | <input type="checkbox"/> 40. <input type="checkbox"/> DDS | <input type="checkbox"/> 45. <input type="checkbox"/> Other _____ |
| <input type="checkbox"/> 36. <input type="checkbox"/> Solaris | <input type="checkbox"/> 41. <input type="checkbox"/> OS/2, OS/2 Warp | <input type="checkbox"/> 46. <input type="checkbox"/> None of the above (1-45) |
| <input type="checkbox"/> 37. <input type="checkbox"/> Windows | <input type="checkbox"/> 42. <input type="checkbox"/> IBM MVS/VM/VSE | |

10. Which of the following Servers/Clients do you have installed/planned at your location?

(check ALL that apply in each column)

A. Servers		B. Clients	
<input type="checkbox"/> Power PC	<input type="checkbox"/> 01.	<input type="checkbox"/> 486, 386, 286	<input type="checkbox"/> 07.
<input type="checkbox"/> Power Mac	<input type="checkbox"/> 02.	<input type="checkbox"/> Sun Sparc	<input type="checkbox"/> 08.
<input type="checkbox"/> Mac Other	<input type="checkbox"/> 03.	<input type="checkbox"/> Risc	<input type="checkbox"/> 09.
<input type="checkbox"/> Multiprocessor Servers	<input type="checkbox"/> 04.	<input type="checkbox"/> Alpha	<input type="checkbox"/> 10.
<input type="checkbox"/> Pentium II (PII)	<input type="checkbox"/> 05.	<input type="checkbox"/> Other	<input type="checkbox"/> 11.
<input type="checkbox"/> Pentium/Pentium Pro	<input type="checkbox"/> 06.		

11. Which of the following hardware platforms are installed/planned in your company?

(check ALL that apply)

A - Mainframes (Large Scale)

1. ☐ IBM
2. ☐ Amdahl
3. ☐ Cray
4. ☐ Hitachi
5. ☐ Unisys
6. ☐ Other _____

B - Minis (Midrange)

1. ☐ IBM RS/6000
2. ☐ IBM AS/400
3. ☐ Digital
4. ☐ Tandem
5. ☐ Unisys
6. ☐ AT&T GIS
7. ☐ H-P
8. ☐ Data General
9. ☐ Other _____

C - Workstations

1. ☐ Sun Microsystems
2. ☐ Silicon Graphics
3. ☐ Digital
4. ☐ H-P
5. ☐ IBM
6. ☐ Other _____

12. What is the estimated gross revenue of your entire company/institution?

(check ONE only)

- | | | |
|---|---|--|
| 01. <input type="checkbox"/> \$20 billion or more | 05. <input type="checkbox"/> \$100 million to \$499.9 million | 09. <input type="checkbox"/> \$4.9 million or less |
| 02. <input type="checkbox"/> \$10 billion to \$19.9 billion | 06. <input type="checkbox"/> \$50 million to \$99.9 million | 10. <input type="checkbox"/> None of the above |
| 03. <input type="checkbox"/> \$1 billion to \$9.9 billion | 07. <input type="checkbox"/> \$10 million to \$49.9 million | |
| 04. <input type="checkbox"/> \$500 million to \$999.9 million | 08. <input type="checkbox"/> \$5 million to \$9.9 million | |

13. For which areas outside of North America do you have purchase influence?

(check ALL that apply)

1. ☐ Europe 2. ☐ Asia 3. ☐ South America 4. ☐ Australia 5. ☐ Middle East 6. ☐ None

Please indicate the names and job functions of other individuals at your location to whom you would like us to send a copy of **NetworkWorld**

NAME _____ JOB FUNCTION _____

NAME _____ JOB FUNCTION _____

NAME _____ JOB FUNCTION _____

NAME _____ JOB FUNCTION _____

NAME _____ JOB FUNCTION _____

Be Sure You Have Completed the Following:

- ☒ Answered **ALL** the questions
- ☒ Signed and dated the form
- ☒ Provided your name, title and company address

Thank You!

▼ 1. FOLD HERE & MAIL TODAY ▼

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Briefs

Giving the Linux bandwagon yet another nudge, **Netscape** last week released beta versions of its Directory Server and Messaging Server software for the open source operating system.

Also released was a final version of Netscape Delegated Administrator 4.0 for Linux, an Internet application that facilitates customer self-service.

In addition, Netscape announced it is working with Compaq, Hewlett-Packard, VA Research Linux Systems, Caldera Systems and Red Hat Software to provide customer support for Linux products.

Netscape: (650) 528-2555

Sonic Systems this month will start shipping SonicWall Pro, a hardware device with Fast Ethernet ports that can be



SonicWall Pro works in networks with up to 1,000 users.

configured as a firewall, content filter, virtual private network and address translation device.

Costing \$2,195, SonicWall Pro is a "low-end firewall" for use in networks of up to 1,000 users, according to Sreekanth Ravi, Sonic Systems president and CEO.

Ravi adds that SonicWall Pro uses the IP Security standard for encryption. The product also can exchange data securely with Check Point Software Technologies' more high-end Firewall-1.

SonicWall Pro has three Ethernet ports.

Sonic Systems: (408) 844-9900

IN-SITE: Lessons from Leading Users

State university Webifies its widespread networks

BY ELLEN MESSMER

The University of California is serving its far-flung networks new courses of intranets, workflow systems and high-speed ATM LANs.

For example, the MIS team at the university system's Office of the President built a Web-based "benefits recalculation tool." Through a browser, administrators can remotely access the university's IBM RS/6000 financial application to calculate benefits for 200,000 employees.

A new interactive voice response (IVR) system is easing the process of applying for loans. The state school system has a \$22 billion retirement fund that employees can borrow against. Instead of heading down to an office, employees can simply dial an 800 number. "We took the whole process and put it up on IVR," says Bruce James, IS maintenance manager in the Office of the President.

With the dial-a-loan process, the caller can begin to apply by punching the keypad for the amount he wants. The IVR loan application, designed by university staff using Edify Corp. workflow tools, sends each loan request to the school's Sybase database, which kick-starts a "work object" on the loan administrator's LAN. Prompted by an item in his work queue, the administrator mails off loan documents to the applicant. The forms are scanned into the university's

FileNet imaging system once they are signed and returned by the applicant.

The imaged documents are added to the loan workflow process, which has cut the approval process to days instead of weeks, James says.

Throughout the state, the University of California campuses are working on network modernization projects.

Gary Forman, director of administrative IS at UC San Francisco, says his campus last year installed the PeopleSoft 7.0 financial reporting application on a Sun server to replace the mainframe ledger system. Now MIS staff is adding the NetDynamics 4.0 application server as the front end so administrators on and off the campus can get PeopleSoft financial data in Web format (see graphic).

At the larger campuses of UC Davis and UC San Diego, MIS staff has installed multimegabit ATM-based campus backbones. The high-speed backbones handle the ever-growing traffic from students and faculty.

For the Davis campus, American Management Systems custom-designed a set of Web-based financial applications running on Hewlett-Packard Unix servers for use by about 20,000 people, according to Tony Flores, associate vice chancellor there.

But UC San Diego chose to build its own set of intranet applications, dubbing



UC's Bruce James (left) is pushing IVR, while Jim Dolgonos eyes security.

them the Link family of Web applications, according to Elazar Harel, UC San Diego's assistant vice chancellor for computing and telecommunications.

These applications include Student-Link, which lets more than 18,000 students enroll for classes or change addresses; FinancialLink, which lets administrators review ledgers and budget statements; and TravelLink, for submitting expenses for reimbursement.

Next up? Tightening security. "All of the Link family is based on passwords, but we want to migrate over to digital certificates," Harel explains. Certificates offer better security than passwords, and the entire university system would like to share a common public-key infrastructure (PKI) for issuing and revoking certificates to students and employees.

A tough test

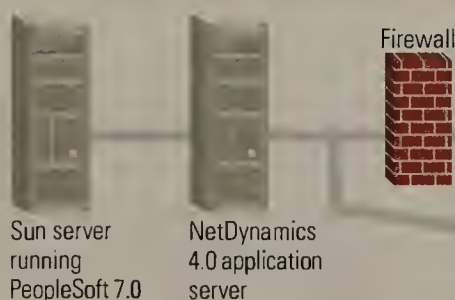
The Office of the President has launched a pilot PKI project, based on Netscape certificate-management and Lightweight Directory Access Protocol servers, to certificate-enable a handful of Web applications. Jim Dolgonos, assistant vice president of IS in the Office of the President, says getting applications to use certificates is not the toughest task. The hardest issue is administrative: properly checking out the would-be user's identity and distributing the certificate to him.

In addition to its Netscape pilot, the university is looking into whether VeriSign could supply and manage certificate distribution for the entire university system. ■

Online Budgeting 101

The University of California at San Francisco made budgeting easier for professors and administrators with Web-based tools.

- 1 UC San Francisco installed PeopleSoft 7.0 as its new financial application to track university department finances...



- 2 ... then Web-enabled it with the NetDynamics application server so college administrators and professors could view reports from their PCs remotely or on the college's LAN.

Tool kills Y2K bugs lurking in database code

BY JOHN COX

BELLEVUE, WASH. — In all the Year 2000 commotion, one potential problem

may be getting overlooked: code that's written in a database language and stored in the database itself.

ServerLogic, based here, has released a

software tool, called SP/2000, to help solve the problem. SP/2000 can sift through this code, known as stored procedures, and highlight lines where there

may be problems. Until now, database programmers have had to use an editing program to read the code line by line.

Stored procedures are similar to directions that tell the database what to do when handling data that's part of a given transaction. For example, a programmer may write a procedure that calculates the final payment date for a loan. But in doing so, the programmer may only use a two-digit field to show the year. The database may then misread the date as 1910 instead of 2010.

To use SP/2000, programmers copy the stored procedures into an ASCII file. They then complete an onscreen form that tells SP/2000 what sequence of code, or strings, to look for. SP/2000 sifts through the file and creates a list of suspect strings. By double-clicking, the programmer calls up a suspect string and decides whether to make changes.

"We did not expect to find problems with our stored procedures as a result of Y2K and international date formats," says Ty Brown, a systems analyst with Guilford Mills, a Greensboro, N.C., textile manufacturer. "SP/2000 quickly searched more than 3,200 stored procedures and triggers. It found three stored procedures requiring changes for Y2K, as well as 86 stored procedures requiring changes for international date formats."

The software is easy to install and use, says colleague Greg Shaull, a database administrator at Guilford: "It comes with a set of predefined strings but gives you the ability to define your own strings."

"The string customization was not well-documented," Shaull adds. "We had to call the vendor's technical support to find out how to [define our own]. But they had us over the hurdle in minutes."

SP/2000 doesn't handle everything, says William Carson, ServerLogic's chief technology officer: "It can cut down the application testing you need to do, but it doesn't eliminate testing."

ServerLogic also offers PB2000, which analyzes PowerBuilder applications for Y2K compliance. SP/2000 is available now for \$3,000, running on Windows NT and working with the Informix, Microsoft, Oracle and Sybase databases.

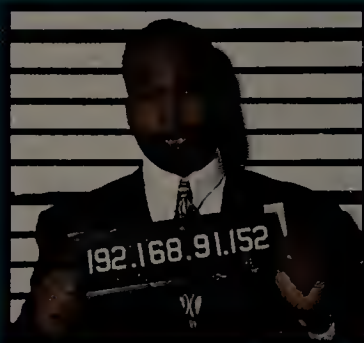
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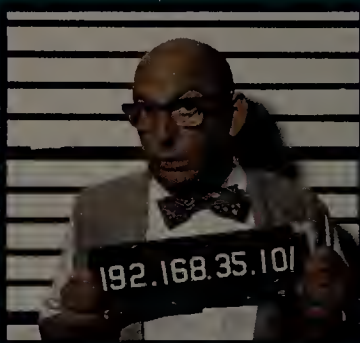
Fred in Marketing

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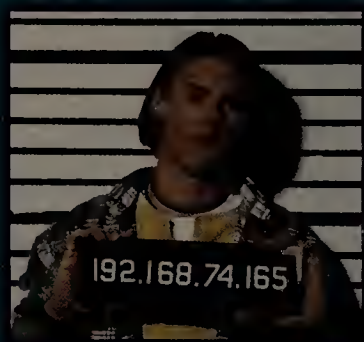
Al in Accounting

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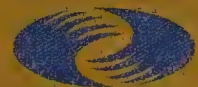


The word is out. Far too many enterprise management projects don't deliver. So, what's the hang up? Recent industry analyst studies reveal that most major framework implementations take too much time and don't deliver ROI. After years of work, only a small portion of purchased functionality is actually implemented. There is a better way.

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*Source: Network Computing. Syracuse University Real-World Labs®, 1999.

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that customers can benefit from now and in the future," said Friedrichs, vice president of marketing, TAIS, CSD. Magnia® 7000 server offers a combination of performance and scalability to address the enterprise

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'Net Insider . Scott Bradner

AN ISP THAT LISTENS TO ITS CUSTOMERS?

Getting your Internet service via cable TV is good stuff. I've been getting Internet connectivity at my house through MediaOne for many

years and can report fast, trouble-free service.

But some people think there are reasons I should not be that happy with

what I have. For example, there have been some privacy worries about this type of Internet access and about cable companies in general. The stories that

came out a week or so ago about Tele-Communications, Inc.'s (TCI) @Home-provided Internet service seemed to confirm the worst fears that anyone could have about the intentions of the cable TV companies.

On Feb. 22, InternetNews.com reported that TCI @Home had e-mailed its subscribers a 9,000-word "take it or leave it" new subscriber agreement. The agreement was reported to have told TCI @Home's 40,000 customers that whether they liked it or not, TCI was going to collect information on their use of the 'Net and then sell that information to advertisers.

The agreement also seemed to prohibit customers from using the service to check their e-mail back at the office or from using secure IP tunneling protocols. If a customer was not willing to sign the agreement, he had to immediately stop using the service. (This is not quite the "harmony of opinion" that my dictionary uses to define "agreement.")

The issue here had nothing to do with the fact that the Internet connectivity was being provided over a cable TV facility. This was the case of an ISP trying to treat its customers like chattel. The customers were seen as useful only for their monthly payments and their surfing habits, which could be tracked for advertisers, who in turn could send more spam to the customers.

But the picture was not quite so clear, or bleak. I talked to an @Home spokesman and discovered there had been a number of misinterpretations of the subscriber agreement — something that was easy to do because it was written by lawyers for lawyers and not for normal humans to read. In addition, TCI and @Home did listen to their customers and have changed their minds about some of the provisions.

@Home offers two types of ISP service: consumer and commercial. The agreement was trying to say that users of the consumer service could not run a business from their house over the consumer service. TCI had been less than clear on the implications of this in the agreement, but the spokesman assured me that customers could check their e-mail, even through encrypting tunnels.

The spokesman also said that TCI only provides aggregate, not individual data, about its customers to others. A new agreement, written in English rather than in lawyer language, is on its way. It's good to see a company respond thoughtfully to customer reactions.

Disclaimer: Harvard has been listening, and occasionally hearing, for more than 360 years. But the above are my notes.

Bradner is a consultant with Harvard University's University Information Systems. He can be reached at sob@harvard.edu.

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Technology Update

Evolving Technologies
and Standards

Ask Dr. Intranet

By Steve
Blass



We have implemented a WAN solution for our intranet with boundary routers and can communicate in static IP with subnet addresses. How can we connect using a Dynamic Host Configuration Protocol (DHCP) server at the central site?

Via the Internet

DHCP is a User Datagram Protocol (UDP), a broadcast-based protocol used to obtain IP addresses for client machines from network servers. Routers at the physical subnet boundaries block DHCP packets by default. Routers are designed not to bridge broadcast traffic across network interfaces, in part to minimize WAN congestion.

Depending on network size, you may want to place DHCP servers on each subnet. This is the way DHCP was designed to be implemented. As a rule, broadcast traffic is restricted to the local subnet. But rules are made to be broken, and central DHCP services are in widespread use across TCP/IP nets.

Enabling DHCP services across router boundaries requires a UDP Broadcast Helper for DHCP. Follow the instructions in your router documentation to turn on forwarding of DHCP traffic. By doing so, the router will bridge UDP traffic on Ports 67 and 68 across the net, and remote sites will be able to use a central DHCP server. Use long DHCP IP address lease times to minimize the broadcast traffic traversing your WAN.

As a network architect at Sprint Paranet in Houston, Blass understands the strain of developing and managing intranets. Send your problems to dr.intranet@paranet.com.

Bringing directory services to voice

BY KEVIN JOHNSON

Voice communication is often the most overlooked feature in discussions about directory services. While most organizations have telephone directories that list the extension for each employee, conference room and the like, most of these directories are still distributed only on paper.

In some organizations, directories are compiled manually or produced via a report generated from a human resources system or custom database. Many large companies with a network of PBXs output information for their directories from the switches. The PBX relies on the directory not only for information about the devices attached to its ports, but also for call routing across voice networks or advanced services. An example of these advanced services is the ability to display the name of the calling or called individual on telephones equipped with LCD displays.

Lightweight Directory Access Protocol (LDAP) allows voice systems, such as PBXs and voice mail, to be an integral part of an enterprise's integrated directory service. LDAP is an access protocol that allows a collection of directories to function as a single integrated directory service, even when different directories reside on different servers.

Using LDAP, enterprise directories can share telephone information about a user with other enterprise directories. Entries for phone system users in other directories, such as e-mail or security, can be automatically updated with phone information housed in the voice directory, as opposed to having to be manually entered multiple times. Moves, adds and changes within an organization can be entered into a central system and copied automatically into appropriate directory services.

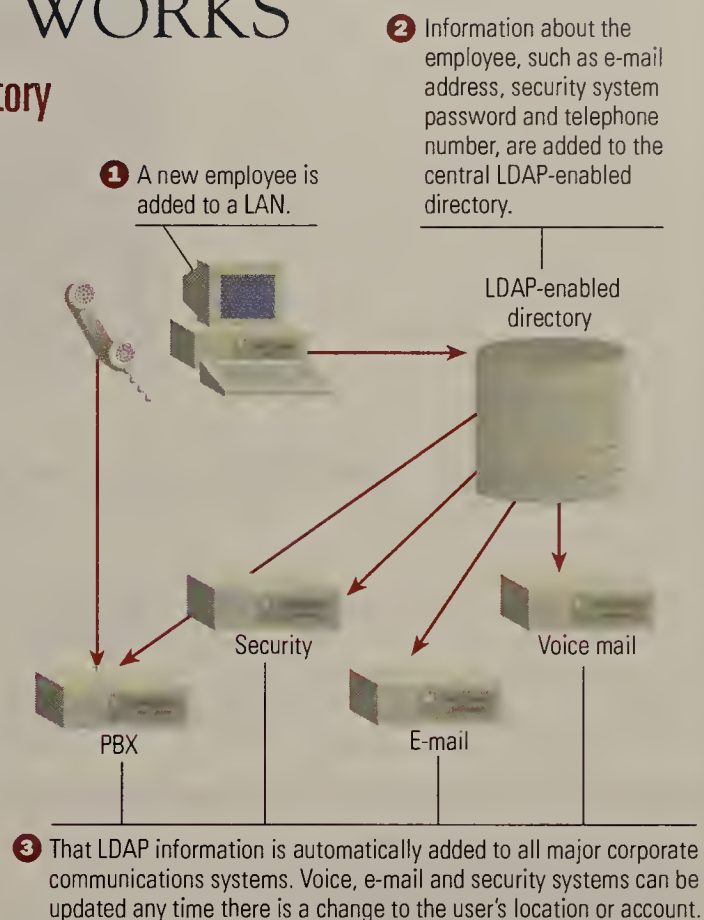
Furthermore, LDAP-enabled voice directories can share information with one another. In the future, information contained within an LDAP-enabled PBX directory will be able to be queried by an LDAP-enabled adjunct voice service, such as voice mail.

Many voice communication systems are specialized "best-of-breed" systems, as opposed to integrated packages from a single vendor. That means LDAP-enabled directories can provide tighter

HOW IT WORKS

Lightweight Directory Access Protocol

LDAP is a protocol that lets a collection of directories function as a single integrated directory service. Using LDAP, for example, telephone information about a user can be shared with e-mail and security directories. The idea is that administrators can enter user information once in a central LDAP location and have the information disseminated across multiple directories.



integration between different voice-related systems.

Most popular e-mail systems, such as Microsoft Exchange, Lotus Domino/Notes and Novell GroupWise, have embraced LDAP, meaning the systems can now be integrated with LDAP-accessible voice directories. But the level of integration that can be achieved depends on the interoperability features provided between the voice and e-mail systems.

The simplest level of integration is information sharing between the two types of systems to minimize redundant manual directory updates. For example, an e-mail program's address book can also be used as a contact management system. The address book contains not only user names and associated e-mail addresses, but also postal address information, department and telephone numbers. Using LDAP, the voice system can update the e-mail system's telephone information as changes occur to the phone system.

A more sophisticated level of integration allows moves, adds and changes in one system to affect the configura-

tion of another system. Establishing a new e-mail account, for example, might bring up configuration parameters for delivering voice services to that same user. So the same configuration interface is used to deliver a range of services, simplifying the overall process of adding users to the network.

LDAP is used as the middleware, or glue, that enables integration of voice and e-mail directory services. Not only does LDAP integration provide voice-enabled directory services, but it is an easy, nondisruptive first step in an organization's migration path toward fully integrated directory services.

As unified networks evolve to contain voice and data applications, management applications also have to evolve to unify the management and accommodate policies and quality of service. Directory services will provide a critical piece of technology to assist unification.

Johnson is manager of the Advanced Networking Technologies group at Mitel in Kanata, Ontario. He can be reached at kevin_johnson@mitel.com.

Gearhead — inside the network machine . Mark Gibbs

OH, THE SIMPLE JOYS OF JAVASCRIPT

I am a big fan of JavaScript. Not that JavaScript is the most elegant or powerful language. Because it is a scripted language it is interpreted, which means it is comparatively slow.

But if you're looking to improve the usability of your intranet or Internet content, JavaScript is a great tool. The language has also been used for other purposes. For example, Adobe Systems Acrobat Forms uses JavaScript as its scripting language.

JavaScript is most commonly found embedded in Web pages. For example, driving buttons that change when you move the mouse over them ("rollover" or "toggle" buttons) use JavaScript.

Although animated buttons are cool, JavaScript has far more profound uses, such as validating data entered in Web forms before the forms are sent to a Web server. This not only reduces the load on the Web server but also provides a more satisfactory experience for the user.

Originally created by Netscape with Sun's help, JavaScript actually has nothing to do with Java — the name was a marketing ploy. Netscape started out calling the language LiveScript but, realizing the opportunity to add



sizzle, switched to the sexier but misleading JavaScript.

Since the first release of JavaScript with Netscape Navigator Version 2.0, the market has accepted JavaScript and its imitators.

Microsoft's implementation is called Jscript, and the European Computer Manufacturer's Association, in conjunction with Netscape, Microsoft and other vendors, has defined a standard for the language called ECMAScript (officially named ECMA-262, which you can find at www.ecma.ch/stand/ecma-262.htm).

(The level of vendor cooperation is surprising, but it hasn't resulted in complete compatibility among the various renditions of JavaScript.)

It is important to understand that

JavaScript is a programming language and its power comes from its interaction with document content. This content is treated as a collection of objects, such as images, tags and links, and its structure is called the document object model, or DOM. JavaScript can create new objects and can also delete and manipulate the attributes of existing objects.

So what could you do with JavaScript? Let me give you an example.

As 2000 approaches, you might notice that not everyone takes the issue as seriously as you do. And while it is possible that laws to limit corporate liability for Y2K problems may eventually appear, don't count on it.

Allow Gearhead to offer a suggestion to keep the issue in people's minds while simultaneously demonstrating JavaScript: Add a Y2K countdown to your Web content. You could do this on your Web server with a Perl script under Common Gateway Interface, but JavaScript is a much easier way to go. Here's the code:

```
<script language="JavaScript">
<!--Begin
var target = new Date("January 1,
2000");
```

```
var now = new Date();
var remain = target.getTime() -
now.getTime();
var howlong = Math.floor( remain /
(1000 * 60 * 60 * 24));
document.write("<center><h2>
There's only " + howlong + " days until
Y2K!</h2>");
// End -->
</script>
```

You should place the code (also listed on www.gibbs.com/gearhead) anywhere in the HTML source where you want the countdown to appear. This particular clock is a much-simplified version of some code written by Alan Palmer.

Pretty simple, eh? Every time the document is loaded, the embedded JavaScript will execute and display the correct number of days until 2000. If the user leaves his browser on that page, however, the value will eventually become wrong. If you check out the URL listed above, I'll show you both the crude and slick ways to solve that problem.

If you have any JavaScript you'd like to share, drop a note to gearhead@gibbs.com.

NetworkWorld Fusion Spotlight

News, tips and tools from our Web site

Selecting an ISP

Class is back in session as the Motley Fool explores the basics of Web hosting.

A few weeks back, the boys behind our "Foo' Bar" column explained how to decide whether to run your own server or have an ISP do it. This week, they take you on a tour of writing a request for proposal. They tell you the tough questions to be sure to ask (hint: "Would you like fries with that?" is not one of

them) and other items you should be sure to include in an RFP. This is one class you won't want to cut.

DocFinder: 1828

ATM vs. Ethernet

A Fusion forum that pitted proponents of the two technologies against each other got us thinking about the relative merits of ATM and Ethernet.

So we promptly called up AltaVista to look for some comparisons and background

information. And now we're passing the savings on to you: We've put together a collection of papers on everything from the strengths and weaknesses of the two technologies on a campus network to building a good interface between an Ethernet LAN and an ATM WAN.

DocFinder: 1827

More than a sales tool

A Fusion user is looking for ways to convince upper management that while electronic commerce is valuable, in the long term there's really a lot more his company should be doing with the Internet, such as developing better relations with customers.

"Are there examples and ideas out there that I can use to try to bring management to the 21st century?" he asks. "Also, are there cost/benefit analyses of how the Web can change the traditional business model, since it all comes

down to the numbers in the end?" Help him out at:

DocFinder: 1830

Accessibility

Access to the Internet continues to be a hot topic.

Several Fusion users agree with our Feb. 10 editorial that AT&T is being hypocritical when it demands open access to regional Bell operating companies' networks, but doesn't want to give competitors the same kind of access to the cable network that AT&T will acquire when it buys TeleCommunications, Inc.

"Funny how AT&T backpedals when the shoe is on the other foot!" one user opines.

Meanwhile, a number of users express amazement that the Federal Communications Commission could rule that links into an ISP are "interstate" in nature. "A long-distance surcharge to access the Internet and do business in it will mean the e-commerce

revolution we have seen will end," writes a user. What do you think? Jump in at:

DocFinder: 1831 (AT&T); 1752 (FCC)

Evaluation of the week

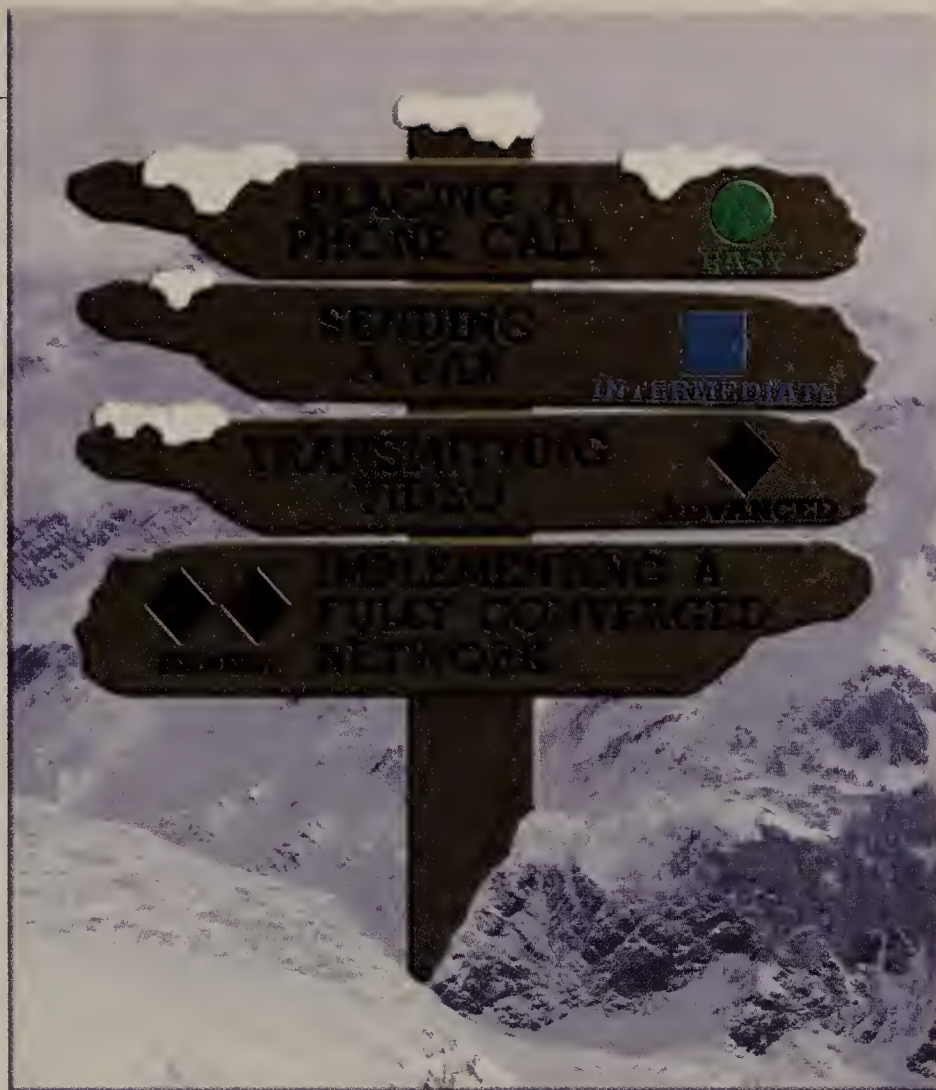
AuditWare for Novell Directory Services is a Windows-based reporting tool from Computer Associates that lets you generate a variety of reports on NDS directories and access control lists. Download a copy of AuditWare, plus other network-management evaluations.

DocFinder: 1832

Finding NW articles

Every Fusion page has a search box for finding current material on the site. But it's not a complete archive of *Network World*. For that, click on the Advanced Search link under the input box. This will take you to a page on which you can search our archives going back several years.

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Program Overview

Implementing a fully converged network requires the careful orchestration of a number of elements including terminals, voice and video codecs, gatekeepers and gateways to other networks. And for a successful implementation, you need all of those components to interoperate — an awesome task that involves adherence to a multitude of standards.

Instruction and guidance are what you need to accomplish this goal. Specifically, you need a complete understanding of the multimedia applications requiring integrated voice/data/video/fax transmission, the network architectures necessary to support those applications and the standards in place to ease your interoperability concerns. This seminar will teach you the steps to designing and implementing an integrated network that delivers cost savings and increased manageability.

Presented by Mark A. Miller, P.E.,
DigiNet Corporation



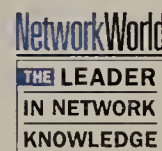
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- Understand the key driving factors behind the Voice over IP initiatives: client applications and economic benefits
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- Understand how the multimedia standards for audio/video coding, signaling, and call management fit together
- Understand how Quality of Service (QoS) issues become key factors for a successful multimedia network implementation
- Understand how network traffic patterns can impact a Voice over IP implementation
- Speak with representatives of sponsoring companies and see live demonstrations of desktop multimedia applications

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Editorial Insights

A challenge to the top operating system vendors

Microsoft, Sun, Red Hat Software, The Santa Cruz Operation (SCO) and Novell — here's a challenge for you.

I'll be moderating a presidential-style debate — dubbed the Operating System Showdown — at NetWorld+Interop in May, and I'm challenging you to send a top technical executive to this event.

Choosing the right operating system for server environments is one of the most difficult decisions a network professional has to make. Unix, NT, Net-

Ware, Linux — each has its strong suit and its weaknesses. Differences in pricing, reliability, scalability, application availability and manageability can be dramatic, and the market seems always to be in flux. Case in point: Just when NT seemed to be taking the world by storm, a rejuvenated Novell brought out the IP-friendly NetWare 5 and Linux began to grab headlines.

This will be *Network World's* seventh Showdown session and, to date, only one vendor has failed to take our challenge. I'm sure the operating system vendors won't disappoint us. The vendor executives will face questions from a panel of industry experts, and then they'll take each other on in a back-and-forth question and answer format. It's hard to hide behind the marketing rhetoric when your rivals are grilling you.

This debate will give buyers a great opportunity to hear more about the vendors' plans for boosting the performance and reliability of their operating systems and directories, improving integration with other platforms, enhancing support for enterprise customers and other issues.

The Operating System Showdown will be held on Tuesday, May 11, from 10:30 a.m. to noon in the Las Vegas Convention Center. Our vendors have until Monday, March 22 to confirm their participation. If one fails to rise to the challenge, we'll invite another competitor.

I'd love to hear what you want covered. What drives you crazy about today's operating systems? What makes an operating system enterprise-ready?

Microsoft, Sun, Red Hat, SCO and Novell — are you up to the challenge?

— John Gallant
jgallant@nvw.com

Message Queue

A BIGGER THREAT

I read with considerable horror Mark Gibbs' "Backspin" column, "Hacking away, and just barely trying" (Feb. 8, page 58).

I was horrified not by how easy it is to connect to someone's unsecured installation of pcAnywhere — I've been using the product for years and have always utilized the security functions — but by how far Gibbs was determined to go to let the unsuspecting user, "Ralph," know that Gibbs was eavesdropping on his system.

Granted, Ralph would do himself a favor by using the password feature of pcAnywhere, but that's for him to decide. Before Gibbs inadvertently hacked into Ralph's computer, Ralph probably didn't have any reason to believe that anyone would do such a heinous thing as type on his screen.

Gibbs took this breach of personal space even further by using information gleaned from Ralph's screen (not his public IP address) to track him down and e-mail him. When this did not garner the response Gibbs desired, he then called Ralph. Did Gibbs really believe this man was interested in talking to a guy who broke into his computer and then went further by tracking down his e-mail address and phone number?

Such activity can be easily interpreted by the recipient as stalking or harassing. Does Gibbs think he comforted Ralph in any way by explaining who he was and what it was he was trying to do?

If I were Ralph, I'd be even more concerned that in addition to the hackers, who are by all accounts not interested in attacking my PC and data, there are self-righteous journalists invading the privacy of others in the interest of proving a point.

If you were walking down the street, tried to open a door and found it unlocked, would you then enter the building with the noble idea of warning the occupants that they should lock their door? This situation is no different.

Glenn Pearl
New Orleans

Send letters to nwnews@nvw.com or John Gallant, editor in chief, Network World, 161 Worcester Road, Framingham, MA 01701. Please include phone number and address for verification.

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I just read Mark Gibbs' piece on inadvertently becoming a hacker and was disappointed to see repeated misuse of the term "hacker," which has been abused by the media for years now.

If you head over to www.dictionary.com and look up hacker, you'll find many definitions. The meaning Gibbs used in his column is the eighth definition (out of nine) and is listed as a deprecated definition with an explanation that the correct term for what Gibbs describes is cracker.

It pains me every time I see this confusion propagated by the media in articles such as this. I consider myself and many of my friends to be hackers, even though we do not perform any of the illegal activities that Gibbs' article suggests are par for the course for such a person.

I felt the article was otherwise well written and its point is worth making. However, I hope Gibbs will choose his words more carefully in the future.

Eric Sharkey
Graduate student
State University of New York at Stony Brook
Stony Brook, N.Y.

WHO'S THE HYPOCRITE?

Regarding your editorial "AT&T is being hypocritical on access" (Feb. 8, page 34):

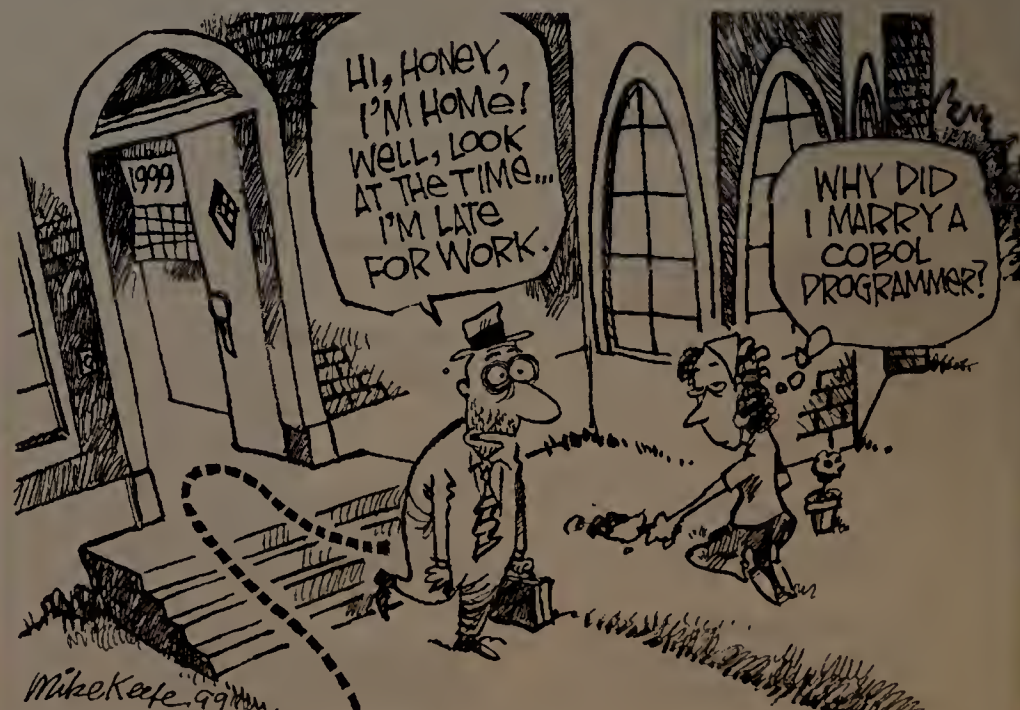
I sure see it differently. In the three years since the telecom act, regional Bell operating companies have done nothing but foot dragging when it comes to opening the local loop for competition.

After repeated failed attempts by all major carriers to pry open the local loop, AT&T has taken the risky approach of trying to build a competing network out of sometimes hodgepodge cable systems.

So what is the response from the same Bells that refused to open their monopolies? They demand that AT&T open its new local network to all comers.

I would expect new editions of major dictionaries to show the pictures of all the Bell CEOs next to the definition of the word hypocrite.

David Green
Naperville, Ill.



RECYCLED DOMAIN NAMING PLAN STILL MISSES THE MARK

It was about this time last year that I wrote an article called "CORE members face defeat" (www.nwfusion.com, DocFinder:1836). The article was sparked by a grim meeting of the Internet Society (ISOC) and its Council of Registrars (CORE) in Washington, D.C. At that meeting, ISOC President Don Heath announced that the plan the group had developed for managing the global Domain Name System (DNS) was probably not going to receive government approval.

I recently got several calls from members of the domain name community asking if I was going to Singapore for a meeting of the International Corporation for Assigned Names and Numbers (ICANN). ICANN was created last year to oversee the DNS, as well as IP addresses and protocols.

Suddenly, I had déjà vu. Among several proposals on ICANN's Web site was one from CORE and the ISOC. It was incredibly similar to the plan shot down last year, which had suggested creating a group that would meet behind closed doors to micromanage domain issues. In effect, this small group of people, represent-

ing mostly business interests, would decide the fate of the global DNS.

Adopting the CORE proposal would transform ICANN from an overseeing group into a governing body that would set rules and enforce them on the Internet — which was the original thrust of CORE.

"It's obvious that [ICANN President] Mike Roberts, who was a member of the old CORE group, scratched out CORE and wrote in ICANN on the proposal," says Tony Rutkowski, a lawyer and an original architect of ICANN.

At its meeting in Singapore, ICANN held two days of public forums and then retired to a closed meeting to make final decisions about the supporting organization proposals. The danger this time is that the group has the backing of the U.S. Department of Commerce.

Ellen Rony, author of *The Domain Name Handbook*, is so opposed to ICANN's closed-door meetings that she has started a gray-ribbon campaign in protest. She's asking parties opposed to ICANN's tactics to put



a gray ribbon icon on their Web sites.

Even Network Solutions, Inc. (NSI), the current domain name handler for .com, .net, .org and .edu, spoke out against ICANN's missteps in its guidelines for accrediting domain name registrars, companies that hand out domains.

"NSI feels strongly that the overall approach taken by [ICANN's registrar guidelines] is not in the best interest of the growth of the global Internet and electronic commerce," wrote Don Telage, senior vice president of NSI, in a memo to ICANN.

But ICANN is not a lost cause. In fact, it merely has to follow the example of one of its supporting organizations, the Internet Engineering Task Force, to regain direction. ICANN should act as a guide for administering domains; it should not be the policy setter and enforcer.

Gittlen is senior reporter for Network World Fusion. She can be reached at sgittlen@nwu.com.

ANTISPAM EFFORT SMACKS OF CYBER-McCARTHYISM

Spam annoys me, but hard-line antispam zealots flat-out scare me.

Of course, I'm biased on this issue. I'm a First Amendment zealot. I am convinced that no one should be able to impose prior restraints on users' freedom to originate, address and submit any messages they wish to any recipients they wish.

What's sticking in my craw is the statement of principles published by the Mail Abuse Protection System (MAPS), a nonprofit consortium that maintains a blacklist of networks with management policies conducive to spam origination or relay. Many companies subscribe to MAPS' Realtime Blackhole List (RBL), which they use to block spammers from invading their networks. You can check out MAPS' policy statement at <http://maps.vix.com/rbl/rationale.html>.

Not content to limit spam to its usual definition of unsolicited bulk e-mail, MAPS ("spam" spelled backwards, get it?) has called into question our basic right to send unsolicited e-mail in any quantity, even if a message were addressed to just one recipient. It's right there in the group's statement: "No Internet user has any fundamental right to send you e-mail or any other kind of traffic. . . . The automatic presumption on the part of all Internet users is that you would be annoyed by e-mail which promotes a unilateral cause (such as making money for the sender)."

The group even goes so far as to imply that sending unsolicited e-mail is tantamount to criminal behavior, saying that spam "is always theft of service no matter what its topic."



In what bizarro universe? Are we prejudging all unsolicited communications as instruments of harassment? Are we raising the possibility of class-action suits against anybody who addresses an unsolicited e-mail advertisement to more than a handful of recipients? Requiring prior authorization to send e-mail to strangers would stop electronic commerce in its tracks and strangle the culture of openness and sharing we've built on the Internet.

What the MAPS people are confusing are two different, but equally valid, rights. On the one hand, freedom of speech requires that we not stop people from submitting any e-mail to whomever they want, in whatever quantities, so long as the sender does not deliberately attempt to send a virus or cause other forms of denial of service.

On the other hand, we also have a right to block any and all mail addressed to us or routed through our networks. This is where MAPS and its blacklist play a very useful role in the online world. The consortium operates like a Better Business Bureau, publicizing spam abusers so potential victims can take defensive countermeasures.

This is all fine and dandy, but who watches the antispam watchdogs? These antispam consortia are a sort of free-floating policy-making bureau, well-meaning but not accountable to anyone in particular. Their goal is to impose on companies everywhere the consortia's conceptions of how messaging systems should be administered. If your company gets on their blacklists and you attempt to take up the matter with them, they'll just lecture you on how you should change your ways.

You won't even know when your company is placed on their blacklists — you'll only know it when

your users' messages are blocked by recipients' domains. You won't be given any chance to appeal the consortia's decisions.

The consortia will, for example, tell you to turn off or severely limit use of the mail relay feature in your Simple Mail Transfer Protocol backbone network. They may have some good advice, but rather than leave it to you to implement as you see fit, they will be in a position to coerce you into compliance.

Does this frighten anybody else? This feels like the makings of cyber-McCarthyism. We're in danger of creating an unelected, quasi-governmental policy-making authority in cyberspace, one that's able to selectively disconnect, disenfranchise and ostracize any organization not recognizing its sovereignty.

Don't get me wrong. I don't want government agencies to start policing the world's e-mail systems. Private-sector watchdog consortia, policies and hotlists are the best, most scalable way to manage this issue in a distributed environment. But the antispam consortia should give suspected spammers a chance to argue their case before they get blacklisted. And the consortia should tone down their strident, adversarial rhetoric, which tends to demonize anybody who disagrees with their worldview.

Hey, my inbox is crammed full of the stuff, too. But I still think we should bring a greater sense of fairness and due process to our dealings with suspected spammers.

Kobielus, based in Alexandria, Va., is an analyst with The Burton Group, an IT advisory service that provides in-depth technology analysis for network planners. He can be reached at (703) 924-6224 or jkobielus@tbgroup.com.

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RATING REFORM

IDG NEWS SERVICE REPORTS

It's

been a full year since a landmark World Trade Organization (WTO) agreement intended to sow the seeds for competition in global telecom markets went into effect. While oases of reform are springing up around the globe, many locations that appeal to U.S. businesses remain barren ground for carrier competition and service offerings.

The WTO agreement, which took hold in February 1998, provides a blueprint for liberalization from the chains of monopoly national carriers and high rates. The accord covers voice, data, fax, leased lines and wireless services.

However, the WTO pact allows the 72 participating countries to open their markets at different speeds, according to different timetables. As a result, competition isn't scheduled to occur for at least another year in many markets, while others are already aggressively offering more choice of carriers and services.

To give you a sense of the level of competition you'll find around the world, we enlisted the aid of the IDG News Service, an international news-gathering organization run by International Data Group, the parent company of *Network World*. This report assesses the status of telecom reform in key countries where U.S. firms have a strong presence.

COMPETITION TAKES ROOT IN ASIA

Asia's telecommunications markets are losing their regulatory shackles more gradually than their Western European and U.S. counterparts, but the global move toward more open markets is driving change.

The region offers a range of market scenarios, from the free markets of Australia and the Philippines, to the largely government-controlled markets of China and Thailand, says Azra Moiz, senior analyst of telecommunications for the Gartner Group in Singapore.

Australia, for example, only became an open market in July 1997, when it had three carriers. At the end of 1998, the country had 25 registered carriers, Moiz notes.

At an intermediate stage in terms of market dereg-

A report card on the state of telecom liberalization around the world, one year after a landmark global telecom reform agreement.



VALERIE SINCLAIR

ulation are places such as Hong Kong, India, Indonesia, Malaysia and Singapore. Taiwan is still a monopoly, but the country will license a new land-line operator next year.

China

Although China allowed China Unicom to begin operation in 1994, incumbent China Telecom still has a huge monopoly. According to Gartner Group figures, China Telecom had 101.6

million customers at the end of 1998, while Unicom had a little more than 3,000 users in October 1998. Both carriers are almost entirely operated by Chinese government departments.

Unicom faces an uphill battle because it has only been allowed to enter a few markets so far.

Analysts say it's unlikely the WTO will manage to pressure China into opening its telecom market to foreign companies because the country sees the industry as having great strategic national importance.

Hong Kong

Hong Kong Telecommunications (HKT) continues to rule the market, though local and foreign players are trying to make inroads into its monopoly.

Competition for local services was first allowed in 1995, but Hutchison Telecom, New T&T and New World haven't made much of a dent — HKT still has a 98% share.

On the international side, HKT last March lost its exclusive rights to provide international land lines. British Telecommunications (BT) and Singapore Telecommunications (SingTel) eagerly snapped up international simple resale (ISR) licenses in Hong Kong in January. ISR allows resellers to offer leased-line service over other carriers' networks. Licenses for the provision of international telecom facilities will take effect on Jan. 1, 2000.

Japan

Although opening Japan's telecom market to competition remains a sticking point for U.S. trade representatives, ongoing deregulation in Japan is making communications less expensive and easier for multinationals operating there.

Now that resellers may offer leased-line service over other carriers' networks, international rates are dropping. Over the past four months, for example, the average cost of a 3-minute phone call from Japan to the U.S. fell from roughly 450 yen to under 200 yen, or about \$1.80. That basic rate should drop further in July when facilities-based carriers will be allowed to change their tariffs without consulting Japan's Ministry of Posts and Telecommunications.

"Corporate users now have more choice ... and enjoy cheaper phone calls," says Toshiaki Iba, a senior analyst at Tokyo-Mitsubishi Securities in Tokyo.

Meanwhile, deregulation is breaking down a wall that segregated carriers by international and domes-

Key

Each area was rated by the following scale:



Green flag: Liberalization laws have been in force for three years or more, and many competitive alternatives to the incumbent telephone company are available.



Yellow flag: Monopoly ownership rights to the voice network ended within the past two years, but only one or two reliable competitors challenge the incumbent.



Red flag: The market for local voice services is still closed, or the basic services market has opened only within the past year.

tic markets. MCI WorldCom, for one, broke ground on its Japanese fiber-optic network last September.

Deregulation is also letting Japan's telecom giant roam unfettered. Prohibited earlier from offering full international services, Nippon Telegraph & Telephone (NTT) is trying to remodel itself into a full network provider to the world's corporations. Its bait is Arcstar, a set of network services targeted at businesses.

Singapore

Singapore's telecom market will get its first taste of competition in April 2000, when the international StarHub consortium will take on the SingTel monopoly.

StarHub is a joint venture between Singapore Power, Singapore Technologies, and overseas partners BT and NTT. Rather than lease capacity from SingTel, StarHub will build its own backbone by running fiber through Singapore Power's cable ducts. SingTel recently announced rate cuts of more than 40% in international and ISDN charges in anticipation of the new competition.

Thailand

Recent delays in changes to Thailand's telecom laws will likely hamper the country's already creeping pace toward liberalization, analysts say. Thailand has begun privatizing its two premier carriers, Telecommunications Organization of Thailand and the Communications Authority of Thailand, and hoped to have a new communications regulatory body in place by October. But few observers believe the government will meet that deadline, and until lawmakers push new legislation through, the market will stay closed to foreign carriers.

Orawan Karoonkornsakul, an analyst at Merrill Lynch in Bangkok, says he can't even hazard a guess as to when liberalization will start in force. Still, at least one industry official is confident that Thailand will have a fully open market by 2006.

AFRICA SLOWLY MAKES INROADS

African nations are taking a gradual approach toward market reform, typically by privatizing the incumbent carrier and assessing its performance before introducing additional competition.

Côte d'Ivoire, Guinea, Senegal and South Africa each used that method, awarding their privatized, previously state-owned operators a period of market exclusivity — usually between four to even years.

However, the respective governments also impose stringent deployment schedules for service rollouts, says Guy Engon Zibi, research analyst for Africa with Pyramid Research in Cambridge, Mass. He expects other African countries to follow suit because this would allow them to maintain some degree of control over carriers.

Foreign telecom firms see Africa as a vast, untapped market. There are only 1.88 phone lines per 100 residents across the 55 countries of the continent, according to the International Telecommunication Union. In contrast, the U.S. has 64.37 phone lines per 100 residents.

South Africa

Liberalization of the South African market is unlikely until the end of incumbent carrier Telkom SA's exclusivity period in 2002, according to Pyramid's Zibi. However, several players have already thrown their hats into the ring, including the state-owned electric utility, Eskom, and Transtel, the telecom division of South African transport firm Transnet.

Zibi believes Transtel will pose the biggest threat to Telkom SA and may well ally itself with a foreign partner when it tries to gain a license. In 1997, the South African government sold 30% of Telkom SA to the Thintnana consortium for 5.58 billion rand, or \$927 million. The consortium comprises SBC Communications and Telekom Malaysia.

EUROPE IS OFF TO THE RACES

Telecom markets in Europe fall primarily into three categories: the leaders, the pack and the laggards.

At the head of the class, the U.K. and Nordic countries have been open to competition for years. Countries in the middle pack are progressing steadily, with fierce price wars in Germany and protests over Internet connection charges springing up around Europe. Bringing up the rear, Russia and Greece lack a solid telecom infrastructure, and Greece has until 2001 to open its market to competition.

Aside from some mobile phone providers that charge special low rates for local calls, there are no serious challengers to the local-loop incumbents across Europe.

Cable networks might offer an alternative, but in Germany the incumbent telco owns a major stake in one of the larger cable companies. In Belgium and the Netherlands, the cable network is too old. "Cable isn't the access road in Europe that it is in the U.S.," says Bernt Ostergaard, a telecom analyst with Giga Information Group in Copenhagen.

When it comes to high-speed networks, however, telecom managers have options. "Frame relay and ATM have wide coverage in Europe, and they cost the same," Ostergaard says. "ATM is now affordable, dependable and available."

Whatever services you purchase in Europe, be sure to include a renegotiation clause in your contract so you can take advantage of the next round of price cuts.

Finland

Expect inventive services in Finland, the country that pioneered Internet banking and the one in which consumers can use their mobile phones to buy a Coke from a soda machine or pay for a drive-through car wash. The nation's data transmission speeds are among the fastest in the world, and the percentage of the population with Internet access also tops the charts.

Telecom liberalization went into effect in 1994, allowing new carriers to enter mobile, long-distance and international markets.

The incumbent Sonera still handles about half of all voice and data traffic in the country, and serves some 70% of the country's mobile users. Sonera's strongest competition in telephony comes from the Finnet consortium of local telephone companies.

France

While the regulatory structure for interconnection agreements is in place and 40 new fixed-line providers hold licenses, the French market today remains at best a duopoly between France Telecom SA and the second-largest telco, Cegetel.

During the first year of competition in 1998, France Telecom watched its revenue from international calls tumble and heard cries of protest from Web surfers who said expensive local calls were stifling Internet growth in France. The incumbent lowered international and corporate leased-line rates but has yet to cave to demands to reduce local rates.

Germany

Long-distance prices in Germany have plummeted as much as 70% since the market opened last year and incumbent Deutsche Telekom lost 20% of its market share. Deutsche Telekom still controls 97% of the local phone network, however. Early last month, the German telco authority set the rate Deutsche Telekom can charge competitors to lease the last mile of copper cabling into consumers' homes. Although the amount was lower than what Deutsche Telekom requested, rival carriers gripe that it's not low enough. Rivals say they can recover costs on ISDN connections — for which customers pay a premium — but still lose money on lower-cost analog connections, which account for roughly 90% of the connections to private households.

For its part, Deutsche Telekom complains that regulators' inexpensive interconnect rates give carriers that don't invest in their own infrastructures an unfair advantage. Carriers such as Talkline, Tele2 Telecommunications and MobilCom — which basically resell Deutsche Telekom's service — have had an easier time competing than larger competitors that built their own networks, such as Mannesmann Arcor, o.tel.o communications and Viag Interkom.

Greece

The Greek telecom market is characterized by a basic lack of infrastructure, and many rural areas lack phone service. The market isn't scheduled to open to competition until 2001. In the meantime, incumbent telco OTE is making big investments in basic infrastructure, says Scott Moore, a research analyst at International Data Corp. (IDC) in London.

Ireland

Although the WTO telecom pact gave Ireland until January 2000 to open its telecom market to competition, the Irish government beat the deadline and liberalized the market in December. The country's telecom regulator awarded 29 operators new telecom licenses: 21 general licenses for voice and data services to the general public; and eight basic licenses that let operators offer data services but not voice.

The incumbent, Telecom Eireann, already faced competition in the mobile telephony sector, but market liberalization opened the door for alternative fixed-line carriers to offer value-added services to domestic consumers and businesses. The challengers include East Telecom PLC, WorldCom and a joint venture between BT and the Irish power utility Electricity Supply Board.

Key

Each area was rated by the following scale:



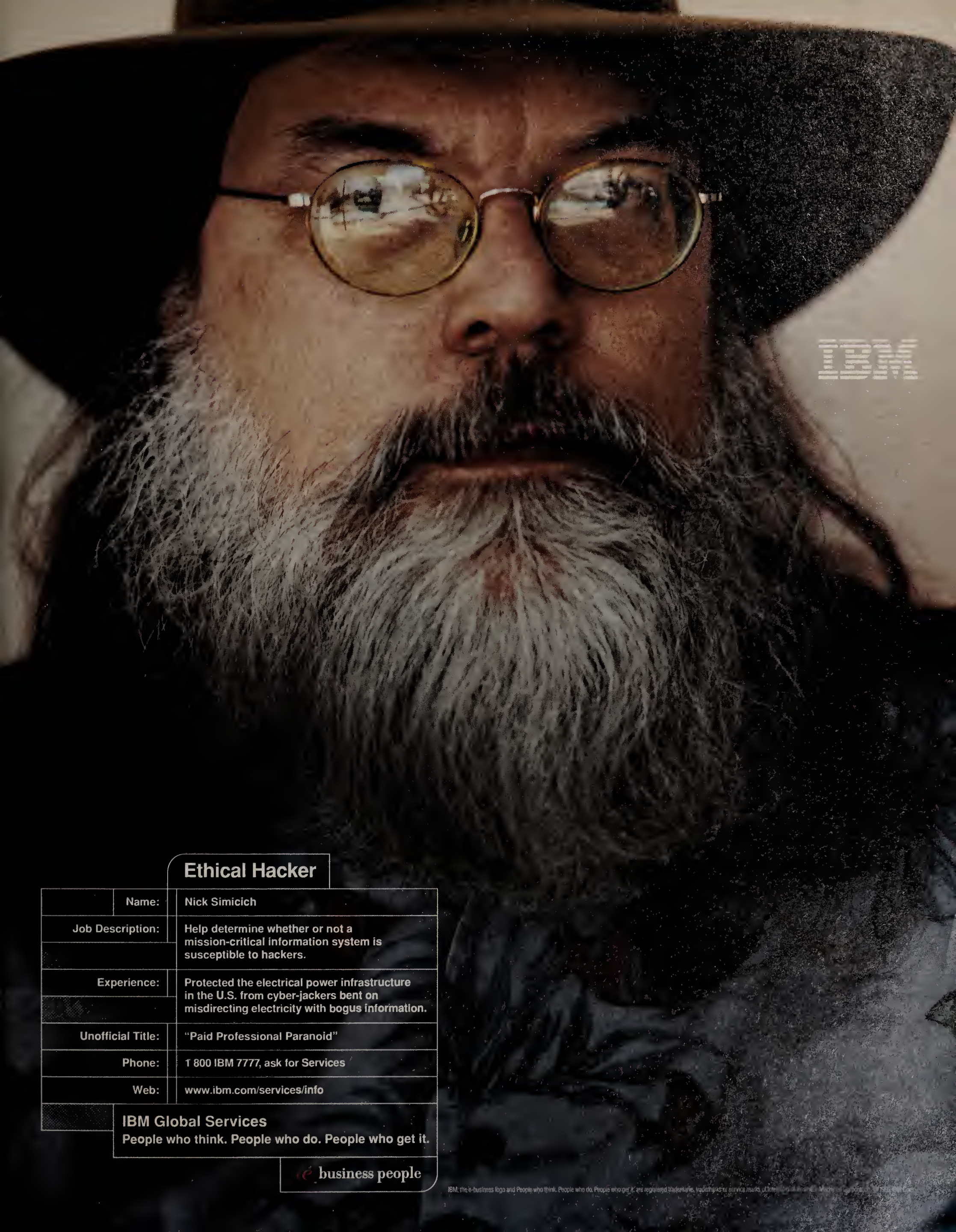
Green flag: Liberalization laws have been in force for three years or more, and many competitive alternatives to the incumbent telephone company are available.



Yellow flag: Monopoly ownership rights to the voice network ended within the past two years, but only one or two reliable competitors challenge the incumbent.



Red flag: The market for local voice services is still closed, or the basic services market has opened only within the past year.



IBM

Ethical Hacker

	Name:	Nick Simicich
Job Description:	Help determine whether or not a mission-critical information system is susceptible to hackers.	
Experience:	Protected the electrical power infrastructure in the U.S. from cyber-jackers bent on misdirecting electricity with bogus information.	
Unofficial Title:	"Paid Professional Paranoid"	
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Italy

As 1998 closed out, 10 companies had been granted licenses to operate nationwide fixed-line services in Italy, while 22 others were authorized to operate at a local level. Growth in the mobile sector continues at breakneck speed, and mobile carriers have long been offering a wide range of competitive pricing schemes.

As new players enter the market, telecom pricing looks increasingly attractive. Early this year, the incumbent Telecom Italia lowered long-distance and international tariffs in response to the increasing competition.



Russia

On average, only 18 out of 100 Russian homes have telephone lines. Telecom infrastructure is best in the country's largest cities — about 40% to 45% of Moscow homes have phone lines and around 30% in St. Petersburg — but penetration in rural areas can drop to as low as 5%, according to IDC.

Gutsy telecom providers see Russia as the land of opportunity, but the country's economic crisis adds to the risk of doing business there.

Russia's regional and national telcos were brought into one holding company during the 1990s. In 1997, the government sold 25% of the holding company, Svyazinvest, to the Mustcomm consortium. However, much of the \$1.87 billion sale price for Svyazinvest went to pay back wages for government employees, rather than toward the improvement of the country's telecom infrastructure. A sale of an additional 24% of Svyazinvest has been delayed since last September.

"I would go with the western carriers who have networks in Russia," advises Giga's Ostergaard. "MCI and Sprint have had strong positions there."



Spain

Spain's telecom market only opened to full competition in December, but the country's latecomer status hasn't stopped it from spawning several aggressive start-ups. Retevision, for example, already has 5% of the long-distance market, while Airtel Moviles holds 30% of the mobile market.

Incumbent Telefonica de Espana has responded by lowering rates by 20% for international calls and up to 51% for Internet access. Businesses looking for value-added services will find a bevy of providers, as that market has been open for nearly 10 years.



Sweden

Reform came to Sweden in the early 1990s, and the market has been expanding ever since. Today, a host of rivals challenge incumbent carrier Telia in fixed-voice telephony, and the country has four mobile networks.

Feeling threatened by rivals, Telia announced plans to strengthen its services by merging with Telenor of Norway. The combined entity plans to go public by the end of next year.

Telia has been steadily losing market share to new entrants since liberalization. Today it retains about 65% of the long-distance market, about 90% of the local market and about 65% of the mobile market in Sweden. Among the many telecom players in the Swedish market, Tele2 (a division of Netcom Systems) is Telia's main competitor.



United Kingdom

The U.K. telecom market is arguably the most open and competitive in Europe, having started down the path of liberalization in 1982.

More than 200 telecom operators provide services, including long distance, voice, data, wireless and even local-loop fixed service, although BT still controls 80% of the fixed-line market. The rapidly expanding enterprise data, voice and mobile communication markets are the most fiercely competitive, with scores of aggressive new entrants. Along with BT, other major players include Cable & Wireless, Colt Telecom and mobile carrier Vodafone.

Most agree that the country has the largest and most varied number of telecom services in Latin America.



Mexico

Mexico is in the process of boosting telecom competition. It opened the long-distance market to competition in 1997, and AT&T and MCI WorldCom entered the arena through separate joint ventures. However, the former monopoly Telmex still leads the market.

Competitors — AT&T and MCI included — have complained about the regulatory agency Cofetel, accusing it of being partial to Telmex and claiming it hasn't done enough to foster competition in the long-distance market. But observers point out that Cofetel's new chief, appointed several months ago, appears ready and willing to make Cofetel a more efficient entity.

Competition for local service is brewing; licenses have been awarded and carriers are getting ready to roll out their services in the coming months.



Venezuela

The dominant carrier, CANTV, has to surrender its monopoly over fixed-line local and long-distance service in 2000, 10 years after being privatized. Currently, there are only two cellular operators, although the government is considering awarding a third license this year. There is widespread competition, however, in the ISP market.

CANADA IS COASTING



Canada

The state of telecom competition in our neighbor to the north is roughly the same as the middle-of-the-pack European countries.

Although competition in the long-distance and data markets has been around since the beginning of the decade, local competition just opened up on Jan. 1, 1998. But the incumbent local players that made up the former Stentor telecom group have not been forced to lease lines to competitors at wholesale rates, thus essentially forcing new players to develop their own facilities.

Nevertheless, local voice rates in some places in Canada are lower than those in the U.S., according to The Yankee Group, a consultancy in Boston. Competitive local carriers, such as AT&T Canada and Metronet Communications, recently began offering small businesses voice rates that are 15% lower than those of the regional incumbents.

Moreover, cable operators such as Videotron Telecom are preparing both local voice service and Internet access. And Lucent and Nortel Networks are partnering with a variety of carriers that are snatching up switches capable of carrying voice over IP networks — one sign that one-stop shopping for integrated local, long-distance and data services is on the horizon in Canada.

Reported and written by Marc Ferranti and Juan Carlos Pérez in the U.S., Jana Sanchez in the U.K., Jeanette Borzo and Kristi Essick in France, Mary Lisbeth D'Amico in Germany, Clare Haney in Hong Kong, Rob Guth in Japan and David Legard in Singapore. The IDG News Service can be reached at newsbox@idg.com.

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LATIN AMERICA IS IN FOR A BUMPY RIDE

By now, it has become evident to many countries in Latin America that lack of competition has resulted in inferior services. Even after being privatized, the dominant carriers continue to exert pressure against reform.

It's too late to turn back, however. AT&T, BellSouth International, France Telecom, GTE, MCI WorldCom, Telecom Italia and Telefónica Internacional have all entered the Latin American telecom market. Smaller, lesser-known companies have also jumped at the chance to provide service.



Brazil

Brazil started its reform process after many of its neighbors, but it has been making up for lost time. The country created a regulatory agency in 1997 and awarded licenses for cellular service that same year.

The government privatized the state carrier, Telebras, in July 1998 after breaking it up into 12 units — three fixed-line carriers, eight cellular operators and one long-distance company.

Competition until 2002 will be controlled and limited in most of those 12 markets to a duopoly — the former Telebras carrier competing against a newcomer.

An interesting situation is developing in Brazil's long-distance market. MCI WorldCom now controls the former Telebras long-distance carrier, called Embratel. In January, the government awarded a license to a consortium to create a long-distance carrier and compete against Embratel; Sprint is a member of this consortium.



Chile

Chile has widespread competition in all sectors of telecom services thanks to the government's unwavering commitment to encourage a free market since the 1980s.

Key

Each area was rated by the following scale:



Green flag: Liberalization laws have been in force for three years or more, and many competitive alternatives to the incumbent telephone company are available.

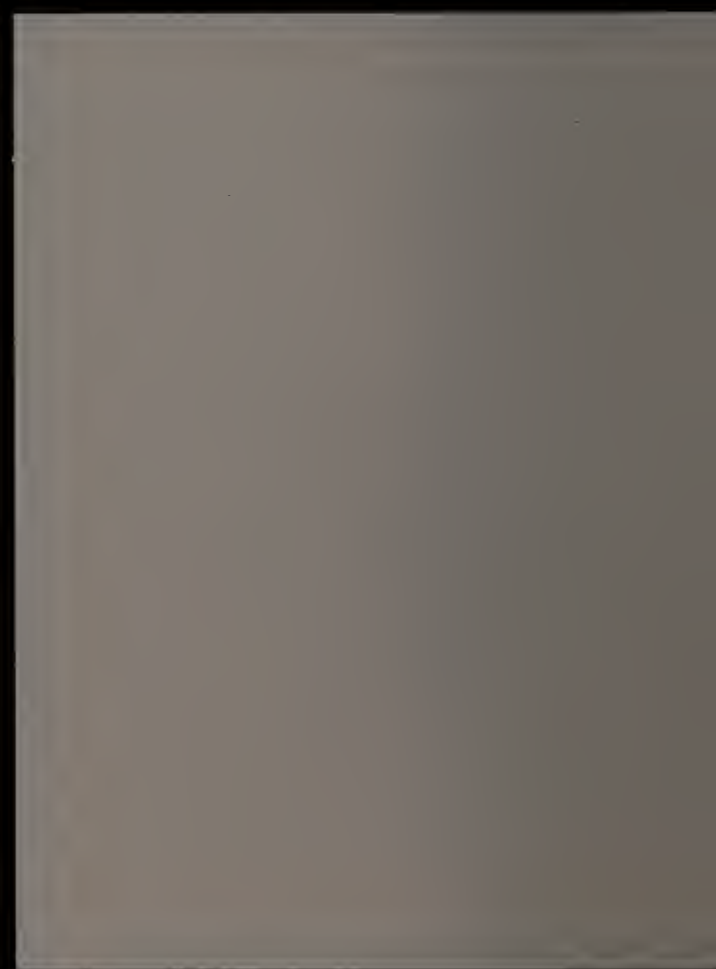


Yellow flag: Monopoly ownership rights to the voice network ended within the past two years, but only one or two reliable competitors challenge the incumbent.



Red flag: The market for local voice services is still closed, or the basic services market has opened only within the past year.





BRIDGING BORDERS

BY ELISABETH HORWITT

No doubt about it, the overseas telecommunications market is getting better all the time.

Deregulation is bringing lower prices and a wider range of data network services to more places. The globalization of world markets is making it easier to build networks that cross borders, and the Internet provides low-cost connections almost anywhere.

While general trends may be positive, deploying and managing a global network remains a complex job requiring considerable expertise, patience and diplomacy. The global telecom market is volatile and fragmented, with each country having unique factors to consider: politics, bureaucracy, language, customs, monetary units, bandwidth availability and service offerings.

With this in mind, we sought out net managers who have been there to share their secrets to success when it comes to building global networks.

Opportunities amidst confusion

The vast disparity between carriers' capabilities is familiar to Black & Veatch Solutions Group, the IT arm of international construction and engineering giant Black & Veatch. It takes about 45 to 60 days and sometimes up to 90 days to deploy new lines in the Pacific Rim, says Alan Richardson, vice president of client services for the Kansas City, Mo., firm. The waiting period is about 30 to 45 days in Europe and 15 to 30 days in the U.S.

However, the plethora of carriers and the growing variety of broadband services have given the firm a smorgasbord of opportunities to cut costs and improve services. "Where five years ago only AT&T could provide us the services we need, now just about every international telco can," says Jerry White, CEO of Black & Veatch Solutions Group. He's also seeing carriers strive harder to work together and avoid finger-pointing.

Getting the most bang for your buck requires comparison shopping, competitive bidding and service benchmarking, all of which take time and expertise, says Len Elfenbein, president of Lynx Technologies, a network integrator and publisher of domestic and overseas telecom rates and tariffs, in Little Falls, N.J. But companies such as Black & Veatch that have the resources to devote to these efforts can save enormous amounts of money, he says.

Get some help

Businesses that lack the ability or will to make this commitment tend to outsource.

The rate of change within photocopier giant Xerox and the volatility of the worldwide telecom industry requires the firm to rely on Electronic Data Systems (EDS) for the bulk of its network operations in Europe and Latin America, says Jack Hennessy, manager of telecommunications for Xerox in Rochester, N.Y. "This lets us focus scarce internal resources on Xerox's core business," he says.

Another strategy is to use a global "supercarrier" that is affiliated with local carriers in various countries. Shell Services International Group of Com-

Network managers share their tips for deploying and managing corporate networks that span the globe.

panies (SSI), an independent IT provider to members of the Royal Dutch/Shell Group, saves itself the headache of negotiating with individual post, telegraph and telephone administrations (PTT) by buying the bulk of its overseas connections through super-carriers such as Equant.

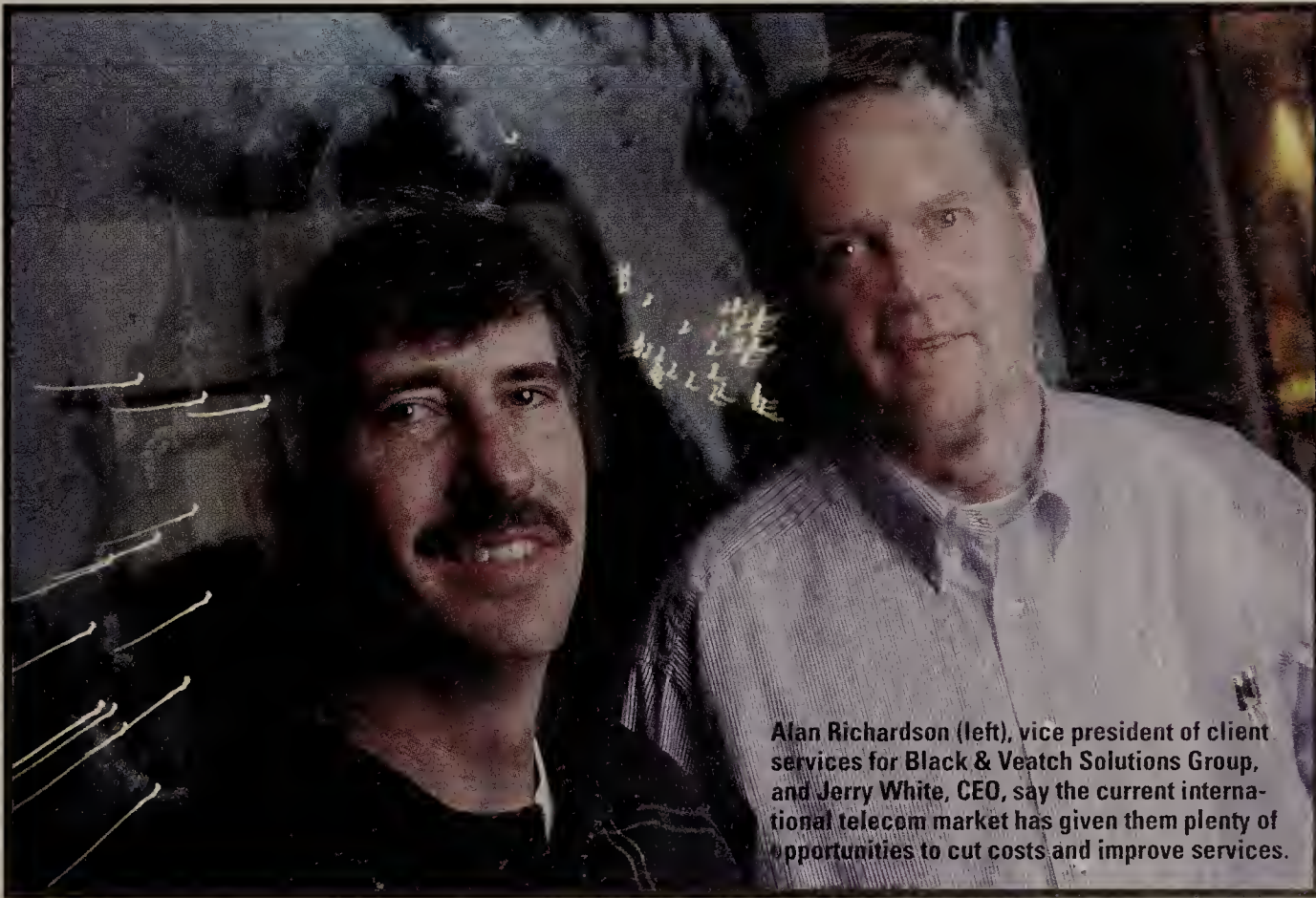
"Equant can deploy lines and resolve problems faster, and get somewhat cheaper bandwidth," says Carl Crites, the Houston-based manager of SSI's Global Connectivity Program. "If you're buying small circuits in a lot of small countries, it's hard to get

Carriers sometimes prefer to pay a penalty rather than spend the money needed to improve quality of service, says Berge Ayvazian, an executive vice president at The Yankee Group, a consultancy in Boston. "A club is no good if it doesn't make them perform," he says.

Shop around and examine carriers' track records before you sign any contracts. "Ask for uptime statistics, mean time to repair and metrics of quality and reliability," Ayvazian advises.

It's also crucial to track and break down the costs of your overseas connections, even though — or especially when — your global carrier, and not you, is responsible for negotiating and overseeing various agreements with PTTs.

Compaq, for example, gets a single monthly charge from one of its global carriers for a circuit from the U.S. to Holland. This eliminates the hassle of getting a separate invoice from each service provider along the route, says Rick Fricchione, vice president of advanced IT and planning at Compaq in Houston. However, he says Compaq always gets its carriers to



Alan Richardson (left), vice president of client services for Black & Veatch Solutions Group, and Jerry White, CEO, say the current international telecom market has given them plenty of opportunities to cut costs and improve services.

leverage with the local PTTs," he says.

Indeed, outsourcing never looked so good to multinational corporations. Customers can now choose from a bevy of global carriers, value-added service providers and systems integrators.

While these providers will deal with all the headaches and hassles of building, managing, monitoring and upgrading a global network, this doesn't always make it easier to ensure adequate service levels for critical applications.

Depending on a global carrier to provide performance information can slow the process of spotting and correcting problems, Crites says. For that reason, SSI is deploying its own monitoring and benchmarking tools.

And service-level agreements don't necessarily guarantee you'll get the level of service you've bargained for.

break down the costs of such circuits on a variety of levels, such as service type or segment.

Don't give away the store

The point is you should be wary of outsourcing all your global services, blindly trusting the outsourcer to look after your interests as market rates and technologies change.

One alternative is selective or strategic outsourcing, in which a firm only hands off certain aspects of global network deployment, management and operations. And perhaps most important, the company maintains at least some network management capability.

What a corporation chooses to keep in-house, and what to outsource, depends on a host of factors: the extent of its internal IT and telecommunications resources overall and in different geographic regions

and divisions; the types of applications that will depend on the network; even the time of day.

For example, while Xerox outsources much of its overseas network operations to EDS, its Asian company, Fuji Xerox Asia Pacific, keeps its telecom operations pretty much internal. Fuji Xerox Asia Pacific has strong internal IT resources and excellent local contacts. Moreover, EDS lacks a strong Asian presence, says Nick Sharp, telecommunications manager for Fuji Xerox Asia Pacific in Singapore.

Black & Veatch Solutions Group turned over line provisioning to global carriers in major urban centers of industrialized countries. However, the firm sends its own people to scout undeveloped areas and forge local relationships in areas where it will soon be doing business.

"We're out in areas where typically there is no infrastructure: no roads, no power," says Richardson, who notes that timing is a key issue. "Large carriers can do it if they have six months, but we need to get local licenses and communications links much faster."

Think globally

Naturally, the more control you maintain over your global network, the more internal resources you must maintain. Furthermore, net managers warn that as your firm's business goals and structure change, you must tweak your IT organization and its management systems.

Compaq, after it acquired Digital, had to restructure the two companies' IT organizations and global networks. Fricchione made the best of new opportunities. For example, Compaq is changing its employees' Internet addresses to take advantage of Digital's Class A address, and both companies are casting off the baggage of some legacy network environments.

During the merging process, Compaq made directory integration a top priority. One hour after stockholders approved the merger, all employees of both firms were included in a single corporatewide net-

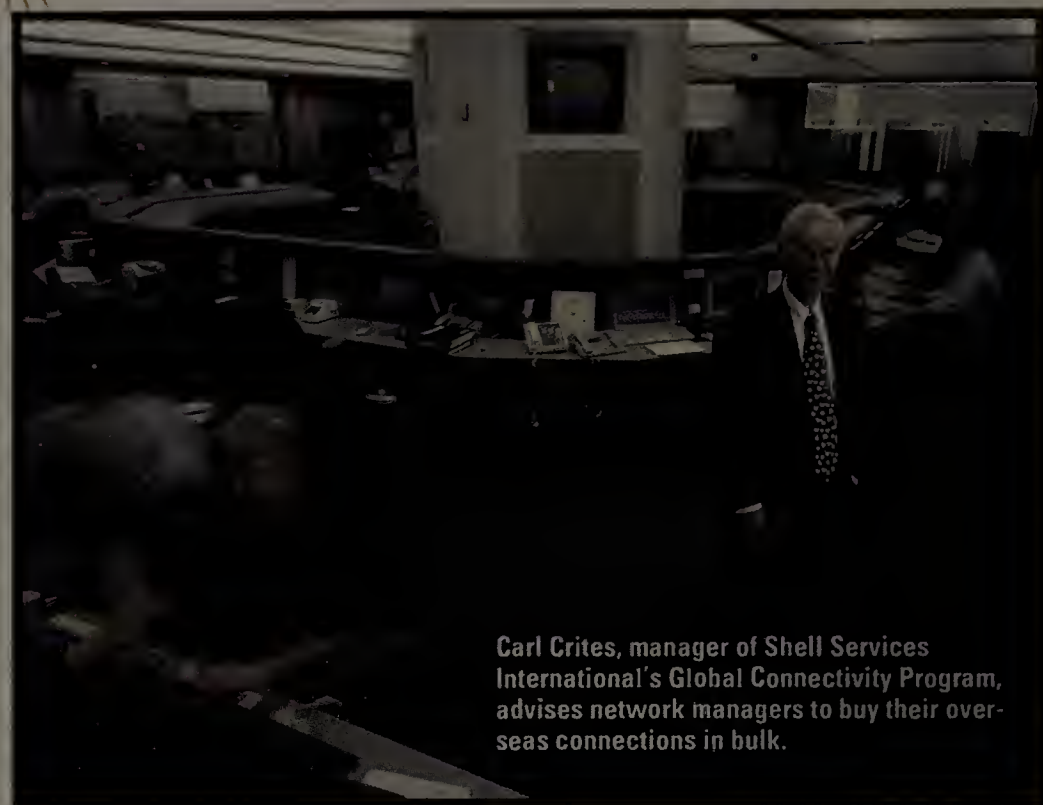
work directory. This gave users the impression of being part of one company even before the networks and services were fully integrated, Fricchione says.

However, the technical difficulties of operating a global network probably won't be the biggest challenge you'll have to conquer. After all, you'll need to learn how to get things done in areas of the world where cultures and business practices can be radically different (see sidebar below).

And an IT organization in the U.S. can have a tough time addressing local cultural clashes and political snafus from 15,000 miles away. Theft, corruption and transport reliability can be big issues in less-developed countries, Fricchione notes. For example, some of Compaq's overseas salespeople didn't have the configuration they needed to complete a shipment in time, so they used system components that had been slated for employee use.

Local labor organizations pose another potential pitfall, Fricchione says. Compaq plans to move its network management center out of Germany, but negotiations with the German Workers Council are holding up the project. The delays may bring Compaq to the point at which the move is no longer cost-effective. "You need to go in with your eyes open to these political issues," Fricchione advises.

Consolidation and reorganization are becoming



Carl Crites, manager of Shell Services International's Global Connectivity Program, advises network managers to buy their overseas connections in bulk.

the norm as U.S. businesses increasingly group their domestic and international network operations under a common umbrella. The Yankee Group's Ayvazian notes. This approach helps companies keep an eye on the big picture and zoom in on individual segments of the network as needed, while also enabling firms to take advantage of volume discounts.

IT provider SSI is in the midst of integrating the U.S. and international networks of its Royal Dutch/Shell Group customers. The goal is to shift 24x7 responsibility for managing the network from one facility to the next as the Earth moves around the sun. "We should be mostly complete by year-end," Crites says.

However, the need for telecom managers from different regional divisions to work as a team is raising some cultural issues. "There's a tremendous diversity of thought, process and business styles," Crites says.

SSI's rollout schedule doesn't allow for the traditional, well-considered planning that European managers expect for such large-scale initiatives, and American managers are often unaware of the long lead-times required in other areas of the world.

To manage these differences, SSI conducted numerous team-building sessions in Houston, London and The Hague. After a year of working together, SSI's virtual team developed its own working style that factors international considerations into project planning, Crites notes.

The bottom line

As you set out to build and manage your firm's global network, count on implementations to take longer than they do stateside, and expect the inevitable cultural and political issues to crop up. But the best advice, according to network managers who have been there, is to rely on third parties when you need to but still retain ultimate responsibility for ensuring that business-critical applications get the network service levels they need.

"When you are spending more than \$100 million per year on a mission-critical network infrastructure, you probably shouldn't outsource it," Compaq's Fricchione says.

Horwitt is a freelance writer and consultant in Waban, Mass. She can be reached at EHorwitt@compuserve.com.

Strangers in a strange land

Take it from Rod White: It's the cultural and political booby traps, not the technical problems, that are most likely to botch an overseas network installation. White, vice president of telecommunications for the Home Shopping Network in St. Petersburg, Fla., spent almost three decades provisioning telecom circuits all over the world, mainly for the U.S. armed forces.

"You have to do your homework to know the right steps to follow for each country," he says.

White shares five tips for working with the locals to deploy international networks.

- Learn the bureaucratic hierarchy. Too many Americans, eager to find the "can-do guy," hang their hats on the first low-level worker who makes promises. "Chances are, he'll let you down," White says. Worse still, in Asia and Latin America in particular, going with the wrong person may cause the real powers-that-be to shut you right down.

- Keep your cool. "If you holler and scream, you'll just go to the bottom of the pile," White says. "You need to keep on smiling and talking because

'no' often means, 'I just want to abuse you a bit.' After 45 minutes it can come around to a 'yes.'"

- Find local help. Get some assistance from a local person who recognizes the potential bear traps in the area and can nurture relationships with those you depend upon. "If you send one of your own people, it ought to be someone senior, not a wrench-turner," White says.

- Grease the wheels a bit. "You won't get these guys to do anything if you just meet in your office," White says. "If you're not willing to entertain, you will find it much more difficult to get things done." Some modest bribes will help your case, too. "I'm not talking big expensive gifts, just a couple of cigars and a case of Budweiser will do it."

- Know who will keep his word on contracts. "Companies I've dealt with in Japan, the Philippines and Thailand won't sign service-level agreements or agree to penalties, but if they tell you they'll do something, they feel morally bound to do it," he says. Then there are countries such as Italy: "They'll promise you anything, no problem. But it doesn't mean much."

— Elisabeth Horwitt

Do one thing and do it well. That's the strategy behind Internet appliances, a growing class of task-specific hardware that began with thin file and Web servers, and now includes messaging servers.

Two of the newest dedicated e-mail devices are Mirapoint's M1000 messaging server and Technaunts' eServer 152. Both were unveiled late last year and emphasize the same functions — receiving and routing Internet and interoffice e-mail. However, one look at their respective horsepowers makes it clear that these two products target different audiences.

The M1000 we tested included an Intel 400-MHz Pentium II, 384M bytes of error checking and correcting (ECC) memory, and a usable storage capacity of

Product: M1000

Vendor: Mirapoint

High volume is no problem for Mirapoint's M1000 dedicated messaging server, which supports thousands of clients on a single server.



18G bytes running BSD Unix. The M1000 also has a \$25,995 price tag (pricing for Mirapoint's smaller scaled M100 starts at \$14,895). The \$1,995 eServer 152 came with a 133-MHz Pentium processor, 32M bytes of RAM, 1.3G bytes of disk space, and runs Linux.

Which product is better suited for your office depends on the number of simultaneous users you have. If you run a large shop and want a single machine to act as an e-mail workhorse servicing thousands of users, Mirapoint's M1000 is well equipped to handle high volumes. If you support a small business or branch office with fewer than 125 users, and you want easy setup and simple operation at a bargain price, look to Technaunts' eServer 152, which includes Web hosting and file and printer sharing in the deal.

Given the size disparity, we didn't pit these two servers in a head-to-head performance comparison. Instead, we focused our tests on setup, management and features. Technaunts' eServer 152 captured our attention early with an incredibly simple installation and configuration routine. However, it was Mirapoint's M1000 that earned our Blue Ribbon Award, thanks largely to its fault tolerance and security features.

Mail call

"Thin server" is a bit of a misnomer when applied to Mirapoint's M1000, which consists of three hefty pieces: the main M1000 unit, a 35-pound external SCSI drive array and a 50-pound UPS. Each piece is about the size of an old AT-style IBM PC.

A SCSI cable connects the storage subsystem to the main unit. Another cable connects the UPS to the main unit for system status monitoring, and a third cable externally connects COM2 and COM3 on the main unit for monitoring the unit's fans, temperature and voltage.

Conversely, Technaunts' eServer 152 spatial requirements are Spartan. The hardware takes up less space than a conventional laptop computer and weighs a little more than four pounds without the power supply.

Review

SPECIAL DELIVERY

Two of the newest thin-server appliances share a dedication to e-mail but target different audiences.

Breadth aside, the M1000 and eServer 152 share some common features. Both include antispam functions that let you blacklist domains from which to reject incoming mail messages, and both can receive mail from other mail domains.

The high-end M1000 features Network Information Service for logon authentication of Internet Message Access Protocol (IMAP) and Post Office Protocol 3 clients. The eServer 152 we evaluated did not support IMAP. Technaunts will not offer IMAP support until the second half of 1999.

Reliability is paramount to the M1000, which

a relay function. In the case of the M1000, we instructed the machine to accept mail coming from any workstation matching the first three numbers of our PC's IP address. With eServer 152, we simply turned on the relay flag under Mail Server Configuration.

The eServer supports Server Message Block (SMB) protocol, which enables the sharing of server file storage and printers. However, as of press time, printer support was sparse and included only the HP LaserJet 6P, HP DeskJet 890C, HP DeskJet 400 and Canon BJC-4200 families. If you need to share printers, stick with the peer networking in Windows 95.

Net Results

M1000

Mirapoint
(408) 517-1300
www.mirapoint.com/304_m1000.asp
\$25,995 base price

Pros

- ▲ Fault-tolerant, robust e-mail
- ▲ Built-in spam filter

Cons

- ▼ High price
- ▼ Tedious setup from unit's front panel

eServer 152

Technaunts
(877) 373-7837
www.technaunts.com/Products/eServer152.html
\$1,995

- ▲ Economical for small business e-mail
- ▲ Built-in spam filter
- ▲ Includes print server software and low-end firewall

- ▼ Potential single point of failure for multiple functions
- ▼ No upgrade path for hardware

includes RAID 5 protection, ECC memory and hot-swappable power supplies and cooling fans. The UPS automatically powers down the main unit and SCSI array when battery power is depleted, and an audible alarm sounds if the unit's fans, voltage, temperature or battery life is suspect. Although you can monitor these thresholds through SNMP, it would be nice if Mirapoint's M1000 included another alert option, such as pager or e-mail.

With both products we ran into a problem sending outbound messages by Simple Mail Transfer Protocol when our Windows 98 client used a host name on our abacustech.net domain that is not present on our Domain Name System (DNS) servers. Neither mail server could identify us, resulting in bounced mail. We corrected the problem with both products by enabling

Technaunts' SMB documentation was also sparse. If you plan to use file sharing with the eServer 152, familiarize yourself with the Samba SMB implementation on Linux.

Getting started

Security was a factor in the M1000's design. Numeric keypad controls for the main units are located behind a locked panel on the front of the unit. The SCSI array also requires a key to remove the drive.

A small LCD panel on the front of the unit asked us for a numeric administrator password, IP address and netmask, default router, DNS server address, host name and domain name. We entered all of the setup information with a telephone-like keypad. Alternatively, you can connect another PC through a null-modem cable and use Windows HyperTerminal to enter the information. One thing missing from the M1000 is inband setup via BOOTP or Address Resolution Protocol.

Configuring eServer 152 is a snap using the supplied esconfig application, which searches your LAN for a new eServer. You simply supply a host and domain name, IP address and subnet mask, and the IP addresses of your DNS servers. The eServer 152 then reboots, and the application launches your browser to finish the setup process.

ScoreCard

	Management 30%	Fault tolerance 25%	Security 25%	Installation 10%	Documentation 10%	Total score
M1000	7 x .30 = 2.10	9 x .25 = 2.25	10 x .25 = 2.50	6 x .10 = 0.60	6 x .10 = 0.60	8.05
eServer 152	9 x .30 = 2.70	3 x .25 = 0.75	6 x .25 = 1.50	10 x .10 = 1.00	4 x .10 = 0.40	6.35

Individual category scores are based on a scale of 1 to 10. Percentages are the weight given each category in determining the total score.

After initial setup, you can administer the M1000 and eServer 152 via a Web browser. For the M1000, if you point your browser to the full host and domain name, you'll be prompted for a user name and password to continue. The default admin name is "Administrator."

We ran into minor problems getting started with both products. With the M1000, we had trouble accessing the Web-based administration after upgrading to the latest Java Virtual Machine for our browser. We fixed the problem by disabling the Just In Time compiler in Internet Explorer.

With eServer 152, we initially had trouble logging on using the changed sysadmin password.

We learned that to reset eServer 152, you have to attach your keyboard and monitor to the unit, restart Linux in single-user mode from the console, and issue a software command to

reset. After the reset, you can run the esconfig applications to change basic network parameters, such as address and host name, while preserving the rest of the server configuration, such as any user IDs and passwords.

All logons to the M1000's BSD Unix variant are disabled for security reasons. The administrator can access the system only by using an account with administrator privileges through a Java client or a command-line interface (CLI). The CLI offers all the commands available through the Java client, but it is not a full shell.

Technauts' eServer 152, in addition to its Web-based administration interface, also supports telnet administration through a nonstandard telnet port as an extra layer of security. Once connected, you'll have full shell access.

One weak aspect of eServer 152 is its poor documentation, which consists mostly of screen shots of the Web administration applet. The documentation we received was labeled as a draft; Technauts says final documentation will be available on its Web site this month.

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In the final analysis, scale is the most distinguishing factor. The M1000 handles significantly larger volumes and is more upgradable than eServer 152. The M1000 is built with a separate I/O subsystem so users can add more SCSI drives for storage space as needed.

Conversely, eServer 152 is a departmental thin server with few upgrade prospects. The model we reviewed contained a laptop-size hard drive with only one ISA slot and a PCI slot that's obstructed by the CPU fan. The eServer's CPU is a first-generation Pentium and not upgradable to Pentium II or Pentium III CPUs.

That said, both products are reliable and relatively easy to use within their respective markets.

Tackett is president of Abacus Technologies, a networking, applications-development and technology assessment company in Houston. He can be reached at rtackett@flash.net.

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Lee Schlesinger, Test Center director

Cool Tools Quick takes on high-tech toys

TOOLS MAKE THE PILOT

Last year I noted that 3Com's PalmPilot had moved from high-tech toy to useful tool. Since then I've discovered a few more add-on utilities that make it even more valuable.

At the top of my list is Landware's

GoType keyboard. Flip it open, fit the Pilot over a serial connector at the top of the keyboard, and you have a full-function keyboard that makes text entry much, much easier. The Pilot stands at an angle that lets you see the

screen as you type. The keyboard weighs less than the Pilot and requires no batteries. It includes several programmable function keys that bring up PalmOS applications, and even has two built-in stands for the stylus on either side of the keyboard.

I've found only one drawback: If the Pilot automatically turns itself off after a minute or two of inactivity, you have to turn the device on and off twice to get it to recognize the keyboard again. Landware is aware of the problem and has been promising an updated driver for months.

For \$80, the GoType keyboard turns my Pilot into the only computer I need to carry on trips. Landware also offers a \$20 case that holds the keyboard and Pilot in one compact, stylish package.

Once I got comfortable with my new keyboard, I turned my attention to an application with which I could use it. While 3Com provides an acceptable tool for text entry with its Memo Pad and Smartcode Software's HandStamp Pro gives me great remote e-mail, I didn't have a spreadsheet on my Pilot.

Luckily, I found Cutting Edge Software's \$50 QuickSheet application. With it, you can create spreadsheets on the Pilot. You can also take Excel spreadsheets on your desktop machine, send them to the Pilot and edit them there. The interface is pretty intuitive; the company has done a good job of working around the limitations of the Pilot's tiny screen. The application is unbelievably robust, supporting all the most essential Excel features, including 45 built-in functions. After you've made changes to a spreadsheet on the Pilot, you can upload it back to your desktop machine when you HotSync and edit it again in Excel.

To support all these applications, I upgraded my faithful companion's hardware with 3Com's Palm 2MB Upgrade. It's a memory card that replaces the existing card in your PalmPilot Professional with double the memory. It also gives you an infrared port and PalmOS 3.0. In effect, it turns your PalmPilot Professional into a Palm III for as little as \$50.

If I'm going to rely on my Pilot as a serious resource, I need serious protection to back it up. BackupBuddyNG from Intelligent Systems does the trick. Unlike most Pilot applications, it takes up no memory on the Pilot — it does all its work from the desktop. While a normal HotSync backs up data, BackupBuddyNG does a complete backup of everything on the Pilot and lets you restore one application or an entire configuration. It's a steal at \$20. ▣

With lower costs and higher performance, WAN services are looking mighty attractive these days. But look out. It's become nearly impossible to see how your many connections and the critical applications they enable are doing. Try to look beyond the LAN and the picture is damn cloudy.

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Downtime

Sabbaticals give pressured IT professionals a chance to slow down and recharge their batteries.

BY LORETTA W. PRENCIPE

John Archer reconnected. Judy Cohen chucked the rat race. Brian Agard took on a project near to his heart.

Archer, Cohen and Agard are among that unusual breed of high-tech professionals who make a career with one company. Each of their employers aims to reward that loyalty and boost retention by offering paid sabbaticals, or extended breaks from work. Sabbaticals are most common at high-tech firms, though the Society for Human Resource Management reports that 20% of all companies offer this benefit.

Leaving the daily grind behind, Archer and Cohen each took time to stop and smell the roses. Archer, an engineering manager at Intel in Hillsboro, Ore., spent three weeks in the British Isles. And Cohen, a manager in the business enterprise solutions group of American Management Systems (AMS) in Fairfax, Va., headed west for two weeks, exploring canyons and a Navaho reservation.

For the rest of their breaks, Archer and Cohen each hung out with their kids and did whatever they wanted whenever they wanted. "There was no emphasis on accomplishment, no schedule," says Cohen, a 20-year AMS veteran who put in seven years as a senior-level employee to earn a sabbatical.

Agard just began his sabbatical this month, yet rest and relaxation isn't on the itinerary. The computer systems analyst for Xerox in New York will spend 10 months working at United Cerebral Palsy of Greater Suffolk in Hauppauge, N.Y.

He is one of eight Xerox employees who earned a spot in the company's paid service leave program this year.

During his stint with the charity, Agard will establish a computer training center, network group homes and develop a virtual reality program to teach clients basic tasks, such as crossing the

street and banking. "My brother's baby was diagnosed over a year ago with cerebral palsy. I wanted to do something to help him out and to learn about the disease," he says. "The best way was to become a full-time volunteer."

Get out of here

The stress of preparing for a sabbatical is almost enough to make you think twice about going. In fact, Cohen needed to postpone her downtime until June 1997 — a full year after she was eligible.

"E-commerce technology was changing so rapidly. I was keeping track of everything from potential vendors to the impact on systems architecture," she says. "I couldn't go."

When Cohen finally did take her 12-week break, she spent the first four days finishing a report at home.

Getting essential duties covered by other colleagues was no big deal for Intel's Archer. Sabbaticals are such an ingrained part of Intel's corporate culture that employees expect to take over the mission-critical tasks of their absent co-workers. Archer's responsibilities that didn't contribute to the bottom line, such as providing career guidance to employees, were shelved during his nine weeks away from the office.

For Xerox's Agard, leaving his duties behind also meant leaving a disappointed boss. He was asked to postpone his sabbatical until this month and to only take 10 months rather than the full year for which he was eligible.

Leaving the breakneck pace isn't easy. "I had trouble not checking my voice mail. It took some weaning," AMS' Cohen says of the first few days of her sabbatical. But once she got past the initial technology withdrawal, the break from e-commerce systems and network integration recharged her spiritually.

Spending the summer with her family relaxing and visiting Canyon De Chelly, Ariz., and Sedona, Ariz., put a new spin on Cohen's views of work and life.

"I rediscovered how much I enjoyed being in an unusual place with unusual people," she says. "It was like being a kid."

Archer also found his downtime energizing.



Brian Agard, a systems analyst at Xerox, earned one of the company's coveted paid service leaves to spend 10 months working for a group that fights cerebral palsy.

When he returned from the British Isles, he became a carpool dad. After years of working 60-hour weeks, Archer was surprised that he actually enjoyed not working.

"I could relax and enjoy the pace of being with the kids. It was a huge revelation," he says.

Back to work

As the summer ended and the kids returned to school, Archer was ready to go back to Intel, though he worried about what he might find when he got there. "During the time my boss was on sabbatical, an entire product line that he was responsible for was eliminated," he says.

Archer lucked out and returned to the same responsibilities he had before leaving.

The biggest change Archer saw was in his struggle to return to Intel's pace and hours. "The first two weeks you couldn't keep me there 40 hours."

Cohen wasn't eager to return to work in the fall, but she says it was OK because her children had just started the school year. "It's much worse to go back after having a baby," she says.

As for Agard, he's not worried about rejoining Xerox next January — he'll have a comparable job when he returns. For now, he's pleased to be lending his IT skills to United Cerebral Palsy so the organization can better serve its clients.

Prencipe is a freelance writer and attorney in Springfield, Va. She can be reached at LWPrencipe@excite.com.

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• Tips for taking a sabbatical.

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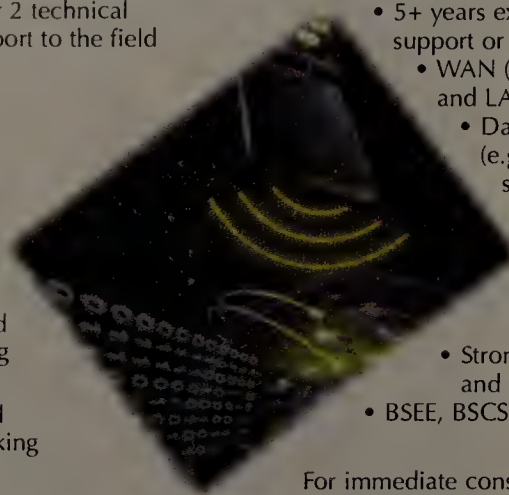
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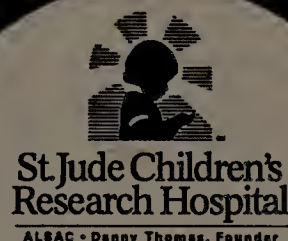
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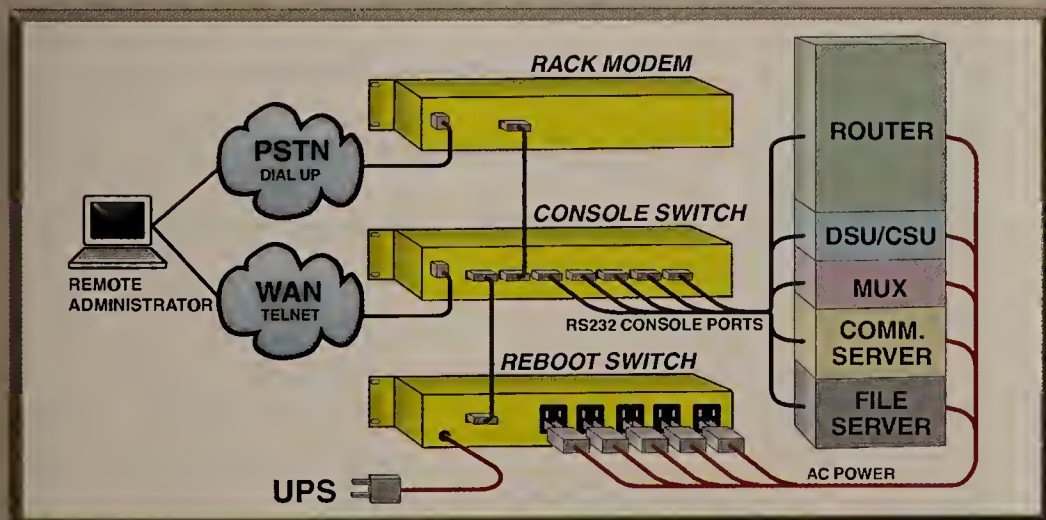
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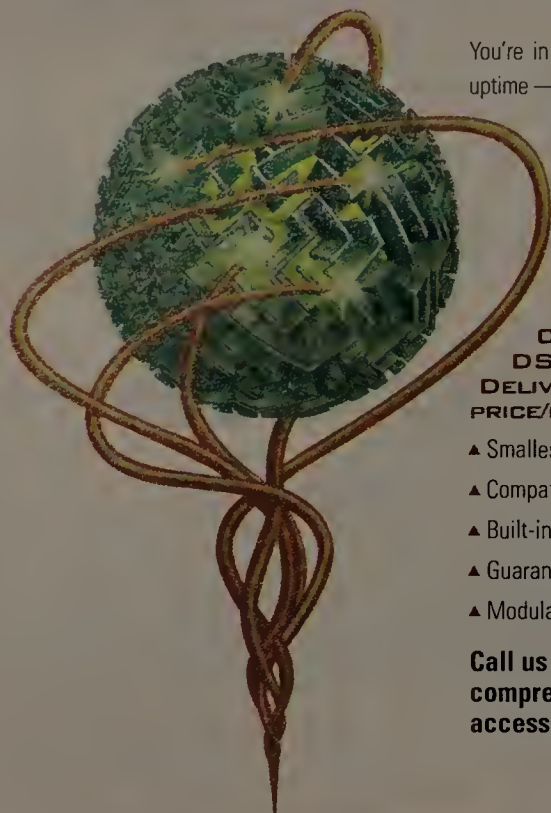
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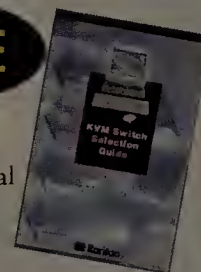
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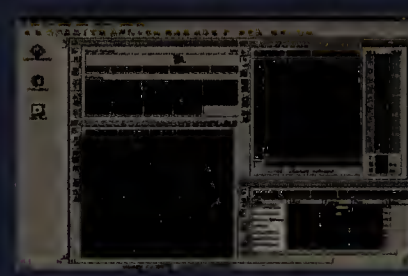
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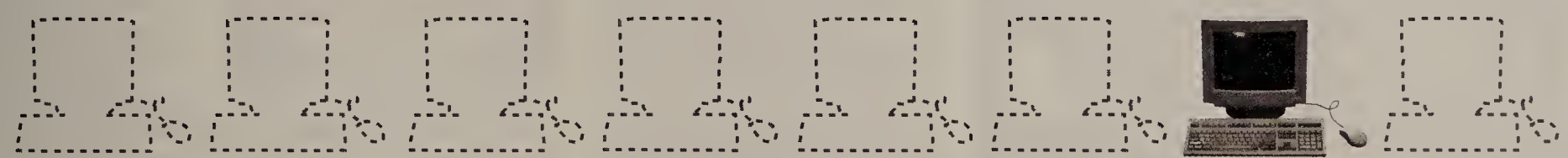
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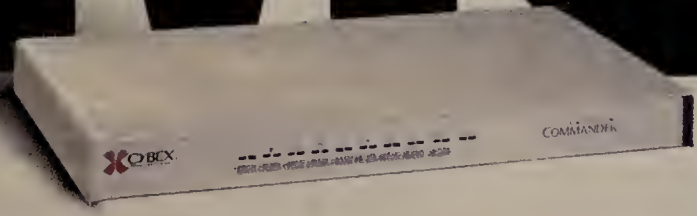


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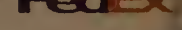
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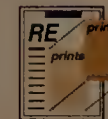


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3Com,
continued from page 1

that 3Com is undervalued," Masri says. "But I like to think our customers know we're not going to do anything stupid. We believe that we have enough strengths to go ahead independently."

Not 3Com's strong suits

The 1998 worldwide markets for modular Layer 2 Fast and Gigabit Ethernet switches:

Layer 2 Fast Ethernet

Revenue	Ports
Cisco75.1%	Cisco70.5%
Cabletron.....8.1%	Cabletron9.6%
Nortel Networks.....4.1%	Nortel Networks...4.4%
Xylan3.3%	Xylan.....2.8%
3Com.....2.6%	3Com2%
Other6.8%	Other10.7%
Total revenue: \$2.3 billion	Total ports: 6.1 million

Layer 2 Gigabit Ethernet

Revenue	Ports
Cisco.....51.1%	Cisco54.7%
Lucent.....17.4%	Nbase15.6%
Nbase.....12.4%	Lucent9.9%
3Com.....3.6%	Hewlett-Packard...4.4%
Hewlett-Packard.....2.8%	3Com4%
Cabletron.....2.3%	Cabletron.....1.8%
Other10.4%	Other9.6%
Total revenue: \$111 million	Total ports: 82,700

SOURCE: DELL'ORO GROUP, PORTOLA VALLEY, CALIF.

Masri made his comments last Wednesday, one day after 3Com CEO Eric Benhamou warned that third-quarter revenue and earnings would fall below Wall Street expectations, in part because of slower enterprise sales in the U.S. and Latin America.

As of last Friday morning, 3Com's stock had lost more than 40% of its value since the beginning of February.

3Com is a leader in the small to mid-size enterprise market and in selling network interface cards and stackable workgroup switches to enterprises of all sizes. But the firm has made little penetration into the core of large enterprise nets.

When 3Com wins the core of an enterprise's network business, 95% of the time it also wins business at the edge of the customer's network, Masri says. But the inverse is not necessarily true.

Indeed, while 3Com is very strong at the edge — it is the leading supplier of stackable LAN switches for wiring closets — it has a "measly 2%" share of the market for larger chassis-based systems that reside in the network core, Masri says.

Masri recently took over for

Ron Sege, who left to join Internet search engine company Lycos.

As the No. 2 data network supplier to enterprises worldwide behind Cisco, why is 3Com not more of a force in the core of large enterprise nets?

"We missed, in the past six years, two key cycles: basic high-density chassis with nice routing technology and 10/100 in the core," Masri says. "I believe it's an unforgivable mistake for a company like 3Com."

But the company has now corrected its errors with the CoreBuilder 9000, a 16-slot, 128G bit/sec frame- and cell-switching chassis, and "one of the better platforms on the market," Masri says. 3Com plans to focus on the CoreBuilder's redundancy fea-

tures and gigabit and Layer 3 switching capabilities, in order to carve out a niche in the enterprise core.

But 3Com hurt itself by taking so much time to roll out the CoreBuilder 9000. Almost a year elapsed between its announcement in late 1997 and shipment in the second half of 1998.

As a result of the product delay, 3Com hasn't been able to establish the track record that other companies have in the core enterprise network gear market, says Mike McConnell, an analyst at Infonetics Research in San Jose.

Competitors have noticed. 3Com rarely shows up in large systemwide enterprise bids, claims Basil Alwan, vice president and general manager of Nortel Networks' enterprise products division.

"Traditionally, 3Com has not put their focus there," Alwan says. "It's a very hard business to get into later . . . if you don't have an established presence."

It's also a tough time to be charging after enterprise accounts, given a general malaise in the market, Masri says. The impact of customers putting off enterprise net upgrades to take care of Y2K

issues has been felt throughout the industry, he adds.

But in enterprises where the company has established a presence, 3Com has satisfied. Sears Credit in Hoffman Estates, Ill., is using 3Com's CoreBuilder 9000 in the core of its Gigabit Ethernet backbone.

"When you make investment decisions in a large organization, obviously they're not solely based on technology," says Rory Herriman, systems manager at Sears Credit. "They're based on items such as service and support, usability and manageability. From that perspective, 3Com works well for us."

It wasn't always that way. 3Com has had to push hard to build a sales and support infrastructure for large enterprises that involves lots of pre- and

post-sale assistance, Masri admits. Traditionally, 3Com has sold its gear to resellers and let them take care of customers.

"We have spent the past year fixing a lot of this, and I feel like we are now just emerging with a system that is reasonable," Masri says. "But we've lost some momentum."

Perhaps 3Com's alliance with Siemens will get the company going again. The two companies are combining 3Com's data communications strength with Siemens' voice network experience to offer customers an integrated collection of products supporting IP telephony and related technologies.

Masri says Siemens' relationships with large customers should help 3Com to open doors.

Microsoft also plays a key role in 3Com's convergence story, Masri says. Microsoft and 3Com formed a partnership in January to embed Microsoft's operating systems into 3Com network gear, including voice/data convergence offerings.

"The Siemens/Microsoft story is all about voice on the high end and low end," says Virginia Brooks, an analyst with Aberdeen Group in Boston. "It's possible for them to gain some presence in the enterprise through that combination, but I don't think that's really pulling them into the core."

Maybe 3Com just has to wait for Cisco to slip up.

"Even in the large enterprise, customers want to have options," Masri says. "Cisco's current position is not sustainable." ■

3COM NET CHIEF SPEAKS OUT

Edgar Masri, recently named senior vice president in charge of 3Com's enterprise business unit, spoke with *Network World* editors last week about 3Com's enterprise network challenges. For an expanded version of this interview, go to www.nwfusion.com, DocFinder: 1838.



and convergence in the small and mid-size enterprise markets (SME). We believe with the [technology 3Com just obtained through its acquisition of NBX] we have a superior solution. We're going to make sure we execute right on convergence in the SME market because we have a strong position there, and we want to use it to get the large enterprises.

On the backbone net equipment market:

We went through home-grown technology to build 10/100 switches and came from being behind Cisco in switching at the edge to being ahead. But when you came down to [backbone gear], we did not have the 100M bit/sec switching. And that's why we have a measly two-something percent market share in that space, and Cisco has the lion's share.

We have corrected our miss with the CoreBuilder 9000, one of the better platforms out there for high availability and Gigabit Ethernet switching. [Another problem has been that] we have approached the enterprise market from a channel perspective. We are just now building the customer supply chain where there is effective preselling, postselling, and service and support.

On data and voice convergence:

Relative to basic data communications companies, we are much better positioned because we have the support and the partnership of a company like Siemens. Relative to voice companies, we have the advantage of the speed at which data communications companies run with things.

We're going to start seeing LAN telephony

On whether 3Com will acquire any enterprise network equipment companies:

No, but I'll qualify that answer. For the past four or five years what we totally missed out on is that it is not only the technology [that's important in considering an acquisition, but also the system sales approach]. If we go and buy a company that has a nice infrastructure, then we are capable enough to leverage it, as opposed to what we did when we acquired Chipcom and Synernetics. We tried to mold them into the 3Com mold.

On what Cisco weakness 3Com would most like to exploit:

I would like to think there's going to be arrogance [on Cisco's part], but they've been very good at executing. So I say this shift to convergence [could be Cisco's weakness]. It's not because Cisco is more exposed than anyone else, but because they are trying to go it alone. They probably will do well in the SME market because even if we have a superior solution, [Cisco's Selsius business] will figure it out, too. But the big battle is in the large enterprise. Lucent and Nortel are taking this challenge very seriously. ■



Compaq stuffs four Pentium IIIs into one new box

BY DENI CONNOR

Compaq in mid-March is expected to announce a slim four-processor Pentium

III server aimed at space-conscious IS professionals. Network World Fusion broke the news about this server last Wednesday.

The unannounced ProLiant server can accommodate four new Intel Pentium III 450-MHz to 550-MHz processors, which Intel will announce

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March 17. The server is available in a 4U configuration, which allows 10 servers to be stacked in a standard rack. A "U" is a standard measurement — 1.75 inches — between holes in rack enclosures.

"Rack-mounted servers are a very strong trend being driven by ISPs and corporations," explains Dan Dolan, industry analyst for Dataquest in San Jose. "ISPs like rack-mounted servers because they can quickly add computing power and applications, and they don't take up more real estate. Corporations are having to assume the role of the ISP, what with corporate intranets and server consolidation."

The ProLiant is expected to have from 256M bytes to 4G bytes of RAM, a 100-MHz front-side bus and a dual Ultra2 SCSI controller, sources say. The server will include a 10/100 Ethernet adapter.

The server can be configured as a rack-mounted device or in a pedestal configuration. Redundant fans and hot-plug redundant power supplies are expected to be optional, sources say. Compaq's Integrated Management Display (IDM) is standard. The IDM is able to report or alert based on a list of critical events, as well as from Compaq Insight Manager and SmartStart.

Sources say the base ProLiant will cost approximately \$6,500 with one Pentium III processor, no drives and 256M bytes of memory. Compaq declined to comment on or confirm details in this report.

Compaq is also expected to announce a tool that makes clustering easier and to disclose its eight-processor server plans. ■

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Martha, leave me alone!

"Do you have a collection of books that has overgrown your bookshelves, or more sheets and towels than will fit in the linen closet? Though the stuff that we all accumulate over the course of our lives is valuable, keeping it all organized, clean and accessible can be a challenge."

— An e-mail message from Martha Stewart Online (www.marthastewart.com)



MARK GIBBS

This week we're going to talk about the doyen of doilies, the diva of decorating, the hostess with the mostest — Martha Stewart. Why? Because I can't get her to leave me alone.

<digression>I was going to follow up last week's column and tell you more about my digital sub-

scriber line experiences, but I haven't had a response from my carrier, IntelNet, and I suspect I won't. When I called IntelNet and asked about the phantom OAN charges, it said the charges were for services that had previously been assigned to that line and IntelNet dropped them. Just like that. Huh? Could this be a case of "cramming" — adding small bogus charges to boost revenue? IntelNet doesn't seem to want to talk to me. Have any ideas?</digression>

Now, being hassled by Martha is a little weird. Although trivial, it is irritating. Martha sends me a couple of messages each week, and I would like her to stop.

Actually, the messages aren't for me; they are for "Shelley" who glories in the e-mail address shell@gibbs.com. In truth, she might glory if only she could get the messages because she's not a user in my domain.

<digression>Speaking of glory-ing in a name reminds me of NBC's three-hour version of *Alice in Wonderland* broadcast on Feb.

28. I have always been infatuated with Alice. So it is with some passion that I say the show had great computer enhancements, a few stunning scenes (the Mad Hatter's tea party, for example, was magic), but why, oh why, did NBC have to embellish and rewrite the story with such wild abandon? Did the network perhaps think that Lewis Carroll's writing wasn't good enough?</digression>

Anyway, I guess Shelley must have entered the wrong domain for herself (duh) when she subscribed to Martha's "Let me tell you how I will make you feel totally inadequate as a homemaker, hostess and parent" newsletter. In the newsletter, Martha says, "If you do not wish to receive e-mail from us in the future, please go to www.marthastewart.com/removename."

Nice idea, but when I went there, what did I find? A request to enter my screen name and password to do the deed. Of course, I had neither as it wasn't me who registered in the first place. Arggggh.

And was there a Webmaster or Webmistress to write to? No. Customer service? No again. Arggggh.

On the roster of bad Web ideas, leaving your street address off your site, omitting the pricing of your products, failing to provide public relations and sales contacts, and having pages so large that they can only be comfortably retrieved if the user is sitting at the end of a dedicated T-3 connection, all rank at the top. And not providing a contact for customer service is right up there, too.

Martha, take a second out from converting an old sofa into a table centerpiece for Easter or crocheting hub cap covers for a '59 Chevy and fix your Web site.

Webmaking tips at nwcolumn@gibbs.com or (800) 622-1108, Ext. 7504.

<footnote>I have written about spam many times, but I'm on the lookout for unusual spam — spam that isn't just trying to sell me something or tempt me into browsing busty, hot coeds. Please send me your favorites at spam@gibbs.com as soon as you can.</footnote>



Ray Ozzie and Mark McGwire ought to sit down for a beer — Buzz will buy.

Sure, one's responsible for putting 30 million fannies into Lotus Notes seats and the other launched 70 baseballs into Major League bleachers, but Ozzie and McGwire really *do* have two things in common:

Their fans can't wait to see what they'll do next, and you can be sure that anything less than another record-breaker will be seen by some as a flop. Unfair? Yes, but that's life in The Bigs.

One glaring difference between the two superstars is that Ozzie has been much better at escaping press attention. Since leaving Lotus in 1997 to nurture an Internet start-up called **Groove Networks**, the man who made groupware famous — and signs autographs at trade shows — has kept remarkably mum. Even an onslaught of undignified begging by yours truly couldn't get Ray to spill more than a few tantalizing hints about Groove.

Groove did just land a quiet \$5.2 million start-up stash from venture firm **Accel Partners**. With the loot come a couple of big bats from Accel who will serve as Groove directors: **Mitch Kapor**, a newly minted partner who founded Lotus back when Notes was only a gleam in Ozzie's eye, and **Jim Breyer**, Accel's managing partner.

"I'm quite fortunate that they've joined me and share my vision, and that we've been able to build such a strong team to date," Ozzie says. "I'm having a blast . . . truly the best of times."

As for details, Groove's Web site offers a clue: "Groove Networks is developing new and highly innovative PC/Internet communication software that will complement the major forms of PC-based, network-based communication methods in use today: e-mail, the World Wide Web, and Notes. . . . We feel that the Internet is in its infancy, and that there is significant value to be gained by thinking a bit differently."

All that thinking and "inventing" takes time, Ozzie insists, and necessitates a low public profile.

However, Groove is currently looking for personal digital assistant and embedded system developers, in addition to object-oriented user interface engineers and quality-assurance overseers, all which may mean at least two things: Groove will play in the so-called post-PC world, and the development cycle probably isn't eons from completion.

Ozzie did say he's got about 35 disciples doing the full-tilt development boogie at Groove's modest digs in Beverly, Mass.

Two predictions: McGwire won't hit 50 homers this year. Ozzie will hit at least one.

My tiny Toyota came within a whisker of bashing Bambi on the drive home the other night, a close encounter that reminded me of two things:

The first was a newspaper column I wrote about loony locals who had their phone numbers on file with the police so they could be called the minute some driver reported fresh roadkill.

Why? . . . "Thems good eatin'."

The second was that it's becoming increasingly clear that middlemen and resellers are going to find themselves roadkill as more and more name-brand manufacturers rumble onto the Internet. One of those Big Boys, **National Semiconductor**, just started accepting direct online orders at www.buy.national.com. The company had previously funneled online orders to a handful of preferred channel partners.

National's not out to croak its partners, which will remain linked to the site, says **Phil Gibson**, the company's electronic commerce guru.

Still, these guys are sporting that deer-in-the-headlights look.

"They're probably not delighted that I'm accepting orders," Gibson acknowledges. "But they probably realize that in this day of the Web, everybody has to do what they have to do."

Grilled venison anyone?

Just because McNamara doesn't end his column with a cutesy tag line doesn't mean he's not interested in your thoughts. Contact him at pmcnamara@nwu.com or (508) 820-7471.



PAUL MCNAMARA



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